



	E	F	N	I	S	Q	H	Q	C	V	K	K	Q	C	P	E	N
Bac 19	<u>GAA</u>	<u>TTC</u>	AAC	ATC	TCG	CAG	CAC	CAA	TGC	GTG	AAA	AAA	CAA	TGT	CCC	GAG	AAC
PF 19			AAC	ATT	TCA	CAA	CAC	CAA	TGC	GTA	AAA	AAA	CAA	TGT	CCA	GAA	AAT

	S	G	C	F	R	H	L	D	E	R	E	E	C	K	C	L	L
Bac 19	TCT	GGC	TGT	TTC	AGA	CAC	TTG	GAC	GAG	AGA	GAG	GAG	TGT	AAA	TGT	CTG	CTG
PF 19	TCT	GGA	TGT	TTC	AGA	CAT	TTA	GAT	GAA	AGA	GAA	GAA	TGT	AAA	TGT	TTA	TTA

	N	Y	K	Q	E	G	D	K	C	V	E	N	P	N	P	T	C
Bac 19	AAC	TAC	AAA	CAG	GAG	GGC	GAC	AAG	TGC	GTG	GAG	AAC	CCC	AAC	CCG	ACC	TGT
PF 19	AAT	TAC	AAA	CAA	GAA	GGT	GAT	AAA	TGT	GTT	GAA	AAT	CCA	AAT	CCT	ACT	TGT

	N	E	N	N	G	G	C	D	A	D	A	K	C	T	E	E	D
Bac 19	AAC	GAG	AAC	AAC	GGC	GGC	TGT	GAC	GCA	GAC	GCC	AAA	TGC	ACC	GAG	GAG	GAC
PF 19	AAC	GAA	AAT	AAT	GGT	GGA	TGT	GAT	GCA	GAT	GCC	AAA	TGT	ACC	GAA	GAA	GAT

	S	G	S	N	G	K	K	I	T	C	E	C	T	K	P	D	S
Bac 19	TCG	GGC	AGC	AAC	GGC	AAG	AAA	ATC	ACG	TGT	GAG	TGT	ACC	AAA	CCC	GAC	TCG
PF 19	TCA	GGT	AGC	AAC	GGA	AAG	AAA	ATC	ACA	TGT	GAA	TGT	ACT	AAA	CCT	GAT	TCT

	Y	P	L	F	D	G	I	F	C	S	*	*
Bac 19	TAC	CCG	CTG	TTC	GAC	GGC	ATC	TTC	TGC	AGC	TAA	TAA
PF 19	TAT	CCA	CTT	TTC	GAT	GGT	ATT	TTC	TGC	AGT		

FIG. 1A

	Site Eco RI	E	F	N	I	S	Q	H	Q	C	V	K	K	Q	C	P	E	N
Bac 19		GAA	TTC	AAC	ATC	TCG	CAG	CAC	CAA	TGC	GTG	AAA	AAA	CAA	TGT	CCC	GAG	AAC
PF 19		AAC	ATT	TCA	CAA	CAC	CAA	TGC	GTA	AAA	AAA	CAA	TGT	CCA	GAA	AAT		
		S	G	C	F	R	H	L	D	E	R	E	E	C	K	C	L	L
Bac 19		TCT	GGC	TGT	TTC	AGA	CAC	TTG	GAC	GAG	AGA	GAG	GAG	TGT	AAA	TGT	CTG	CTG
PF 19		TCT	GGA	TGT	TTC	AGA	CAT	TTA	GAT	GAA	AGA	GAA	GAA	TGT	AAA	TGT	TTA	TTA
		N	Y	K	Q	E	G	D	K	C	V	E	N	P	N	P	T	C
Bac 19		AAC	TAC	AAA	CAG	GAG	GGC	GAC	AAG	TGC	GTG	GAG	AAC	CCC	AAC	CCG	ACC	TGT
PF 19		AAT	TAC	AAA	CAA	GAA	GGT	GAT	AAA	TGT	GTT	GAA	AAT	CCA	AAT	CCT	ACT	TGT
		N	E	N	N	G	G	C	D	A	D	A	K	C	T	E	E	D
Bac 19		AAC	GAG	AAC	AAC	GGC	GGC	TGT	GAC	GCA	GAC	GCC	AAA	TGC	ACC	GAG	GAG	GAC
PF 19		AAC	GAA	AAT	AAT	GGT	GGA	TGT	GAT	GCA	GAT	GCC	AAA	TGT	ACC	GAA	GAA	GAT
		S	G	S	N	G	K	K	I	T	C	E	C	T	K	P	D	S
Bac 19		TCG	GGC	AGC	AAC	GGC	AAG	AAA	ATC	ACG	TGT	GAG	TGT	ACC	AAA	CCC	GAC	TCG
PF 19		TCA	GGT	AGC	AAC	GGA	AAG	AAA	ATC	ACA	TGT	GAA	TGT	ACT	AAA	CCT	GAT	TCT
		Y	P	L	F	D	G	I	F	C	S	S	S	N	F	L	G	I
Bac 19		TAC	CCG	CTG	TTC	GAC	GGC	ATC	TTC	TGC	AGC	TCC	TCT	AAC	TTC	TTG	GGC	ATC
PF 19		TAT	CCA	CTT	TTC	GAT	GGT	ATT	TTC	TGC	AGT	TCC	TCT	AAC	TTC	TTA	GGA	ATA
		S	F	L	L	I	L	M	L	I	L	Y	S	F	I	*	*	
Bac 19		TCG	TTC	TTG	TTG	ATC	CTC	ATG	TTG	ATC	TTG	TAC	AGC	TTC	ATT	TAA	TAA	
PF 19		TCA	TTC	TTA	TTA	ATA	CTC	ATG	TTA	ATA	TTA	TAC	AGT	TTC	ATT			

FIG. 1B

ATG AAG GCG CTA CTC TTT TTG TTC TCT TTC ATT TTT TTC GTT ACC AAA TGT
M K A L L F L F S F I F F V T K C

CAA TGT GAA ACA GAA AGT TAT AAG CAG CTT GTA GCC AAC GTG GAC GAA TTC
Q C E T E S Y K Q L V A N V D E F

AAC ATC TCG CAG CAC CAA TGC GTG AAA AAA CAA TGT CCC GAG AAC TCT GGC
N I S Q H Q C V K K Q C P E N S G

TGT TTC AGA CAC TTG GAC GAG AGA GAG GAG TGT AAA TGT CTG CTG AAC TAC
C F R H L D E R E E C K C L L N Y

AAA CAG GAG GGC GAC AAG TGC GTG GAG AAC CCC AAC CCG ACC TGT AAC GAG
K Q E G D K C V E N P N P T C N E

AAC AAC GGC GGC TGT GAC GCA GAC GCC AAA TGC ACC GAG GAG GAC TCG GGC
N N G G C D A D A K C T E E D S G

AGC AAC GGC AAG AAA ATC ACG TGT GAG TGT ACC AAA CCC GAC TCG TAC CCG
S N G K K I T C E C T K P D S Y P

CTG TTC GAC GGC ATC TTC TGC AGC TAA TAA
L F D G I F C S * *

FIG. 1C

GAA ACA GAA AGT TAT AAG CAG CTT GTA GCC AAC GTG GAC GAA TTC
E T E S Y K Q L V A N V D E F

AAC ATC TCG CAG CAC CAA TGC GTG AAA AAA CAA TGT CCC GAG AAC TCT GGC
N I S Q H Q C V K K Q C P E N S G

TGT TTC AGA CAC TTG GAC GAG AGA GAG GAG TGT AAA TGT CTG CTG AAC TAC
C F R H L D E R E E C K C L L N Y

AAA CAG GAG GGC GAC AAG TGC GTG GAG AAC CCC AAC CCG ACC TGT AAC GAG
K Q E G D K C V E N P N P T C N E

AAC AAC GGC GGC TGT GAC GCA GAC GCC AAA TGC ACC GAG GAG GAC TCG GGC
N N G G C D A D A K C T E E D S G

AGC AAC GGC AAG AAA ATC ACG TGT GAG TGT ACC AAA CCC GAC TCG TAC CCG
S N G K K I T C E C T K P D S Y P

CTG TTC GAC GGC ATC TTC TGC AGC TAA TAA
L F D G I F C S * *

FIG. 1D

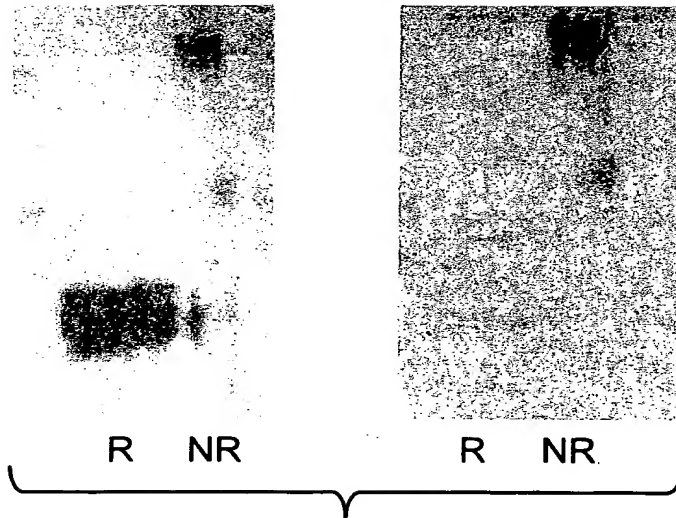


FIG.2A

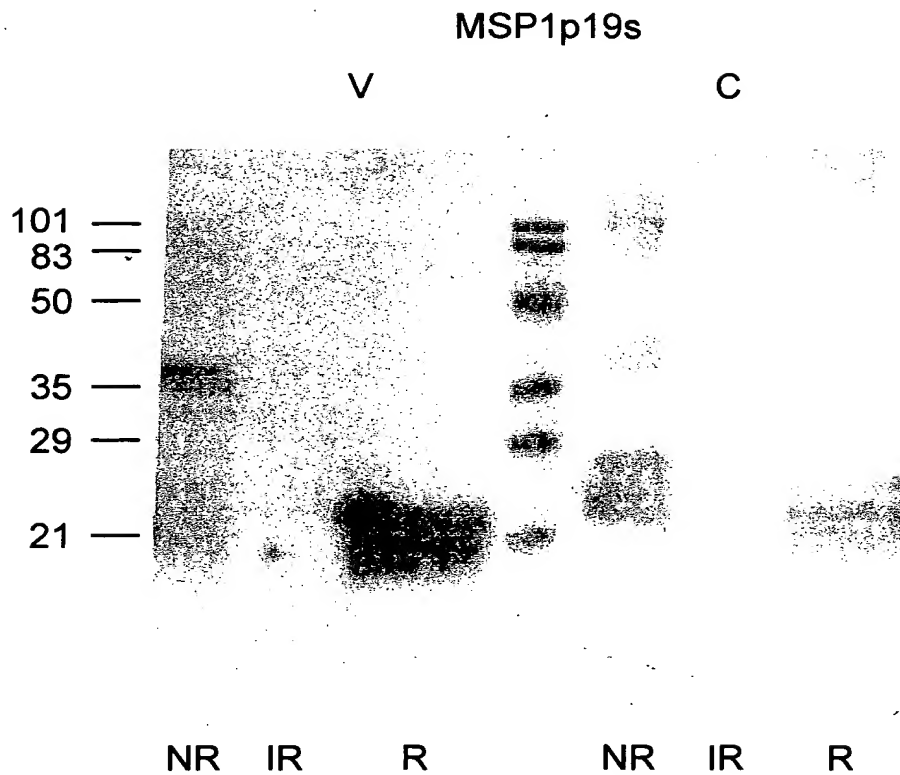


FIG.2B

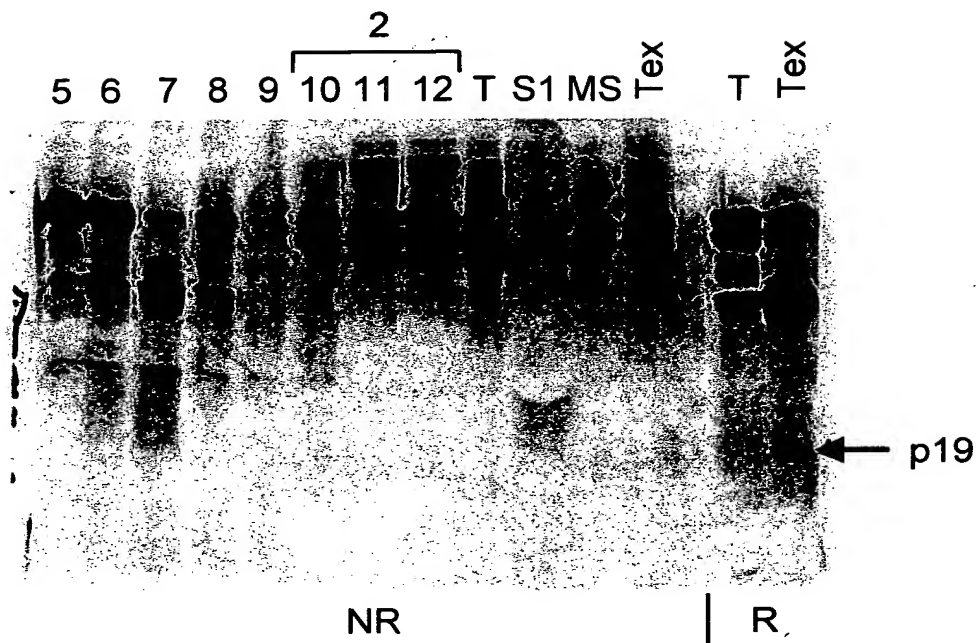


FIG.3A

ELISA INHIBITION BY P. VIVAX MSP-1 P42 AND P19 ANTIGENS

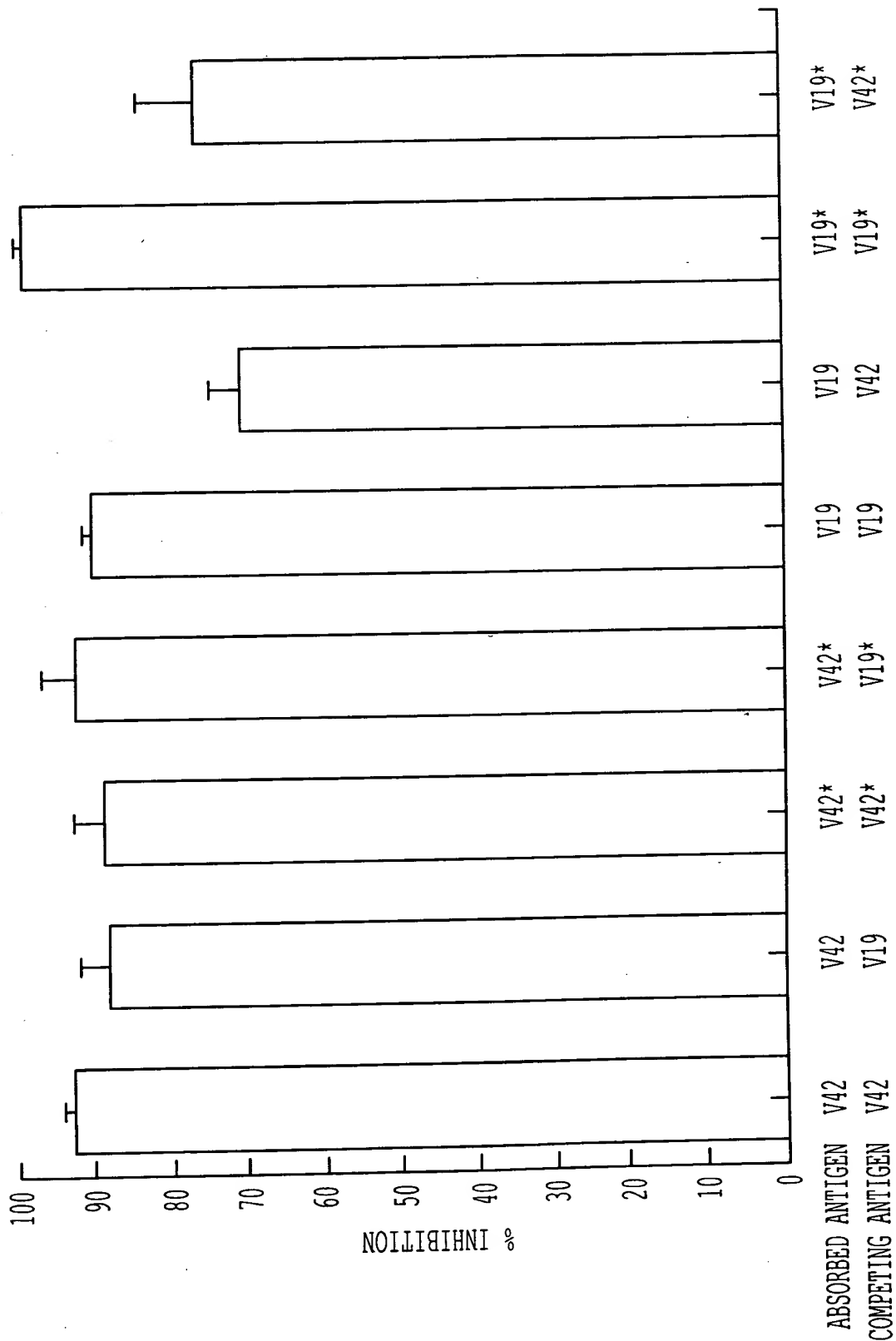


FIG. 3B

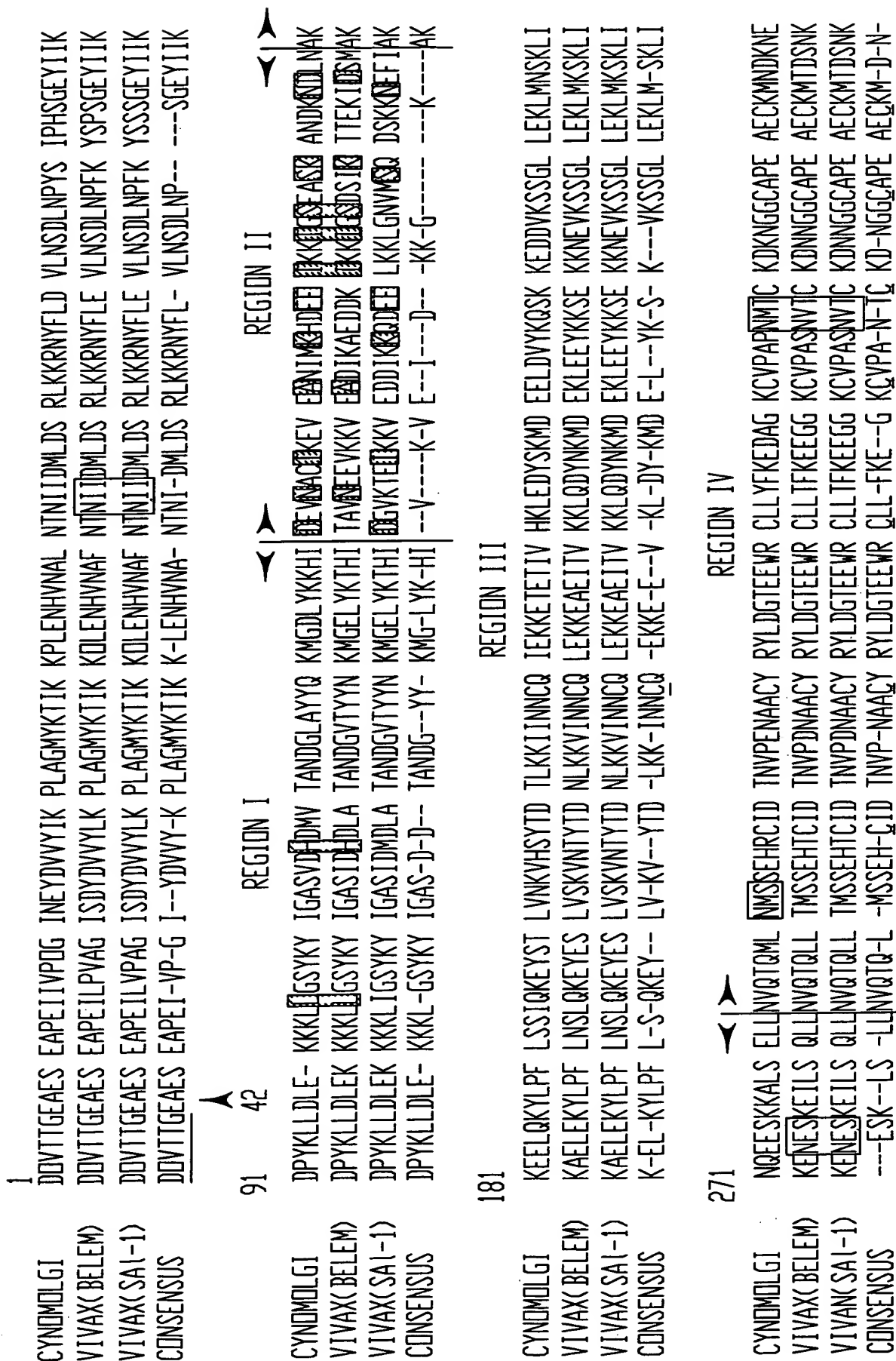


FIG. 4A.1

361
 CYNOMOLGI IVCKCTKEGS EPLFEGVFCS
 VIVAX(BELEM) IVCKCTKEGS EPLFEGVFCS
 VIVAX(SA1-1) IVCKCTKEGS EPLFEGVFCS
 CONSENSUS IVCKCTKEGS EPLFEGVFCS

FIG. 4A.2

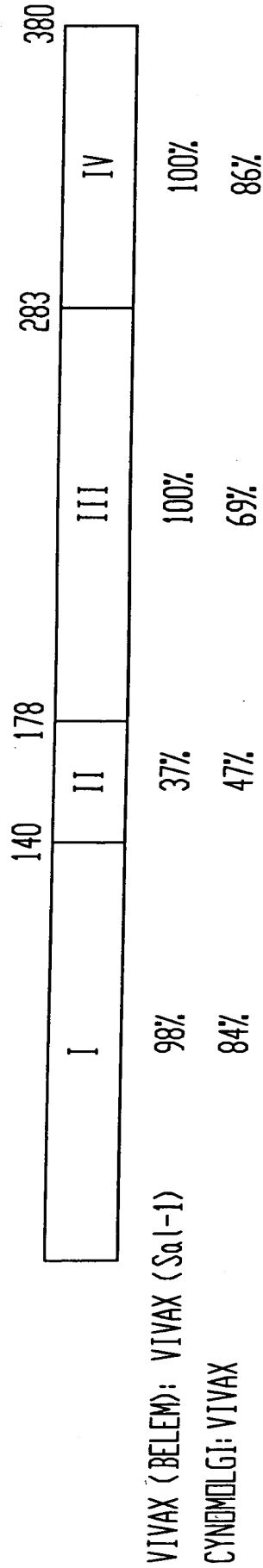


FIG. 4B

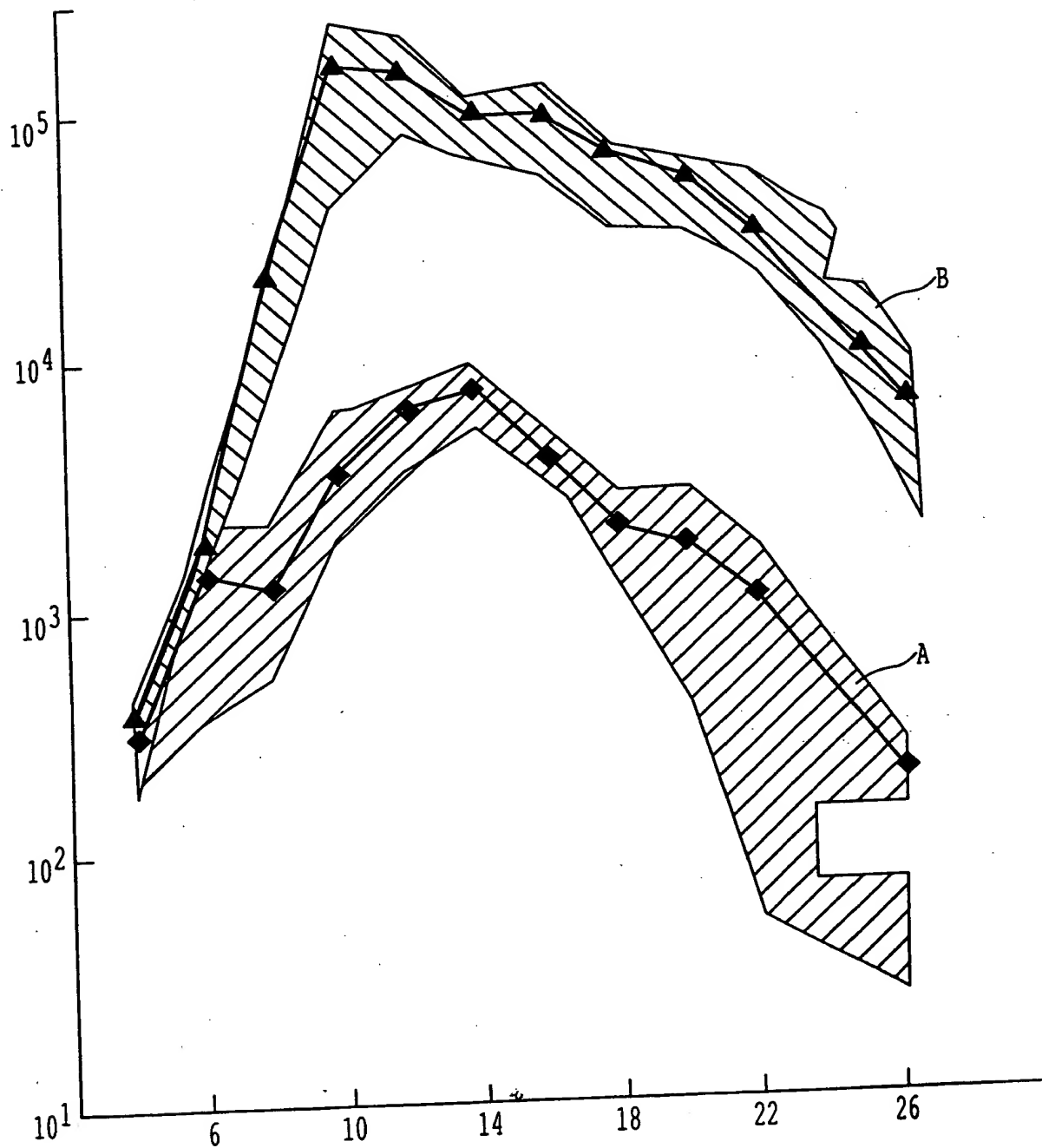


FIG. 5

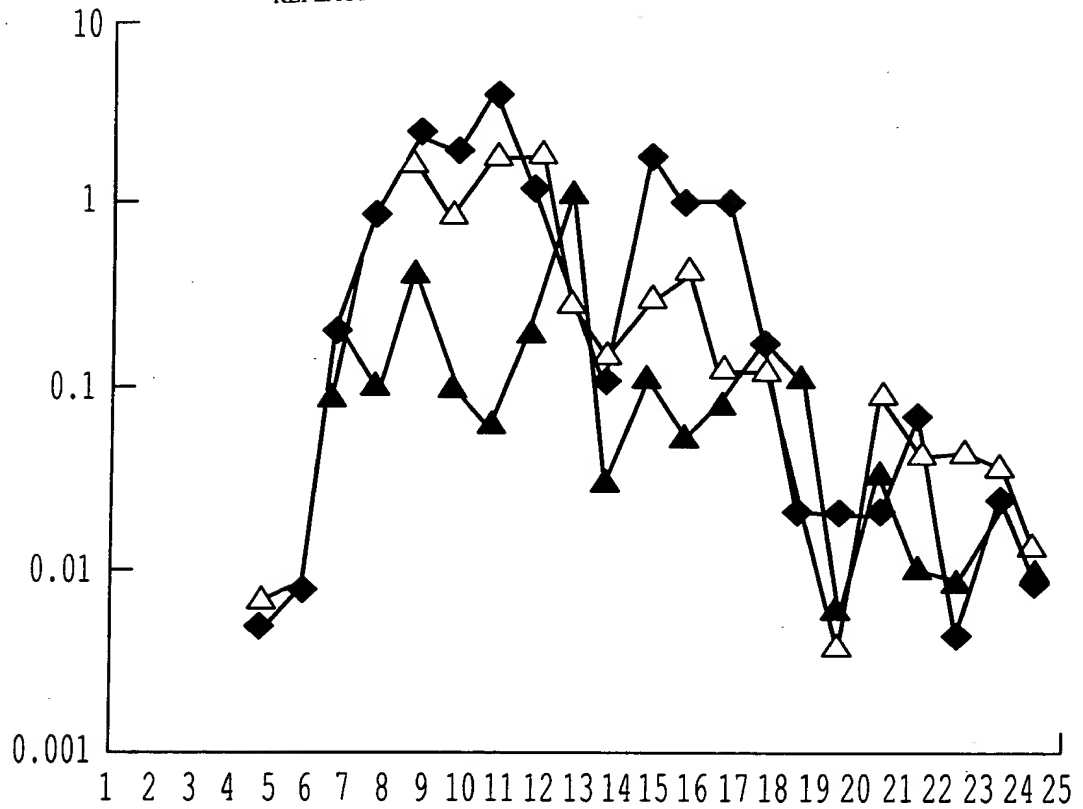


FIG. 6A

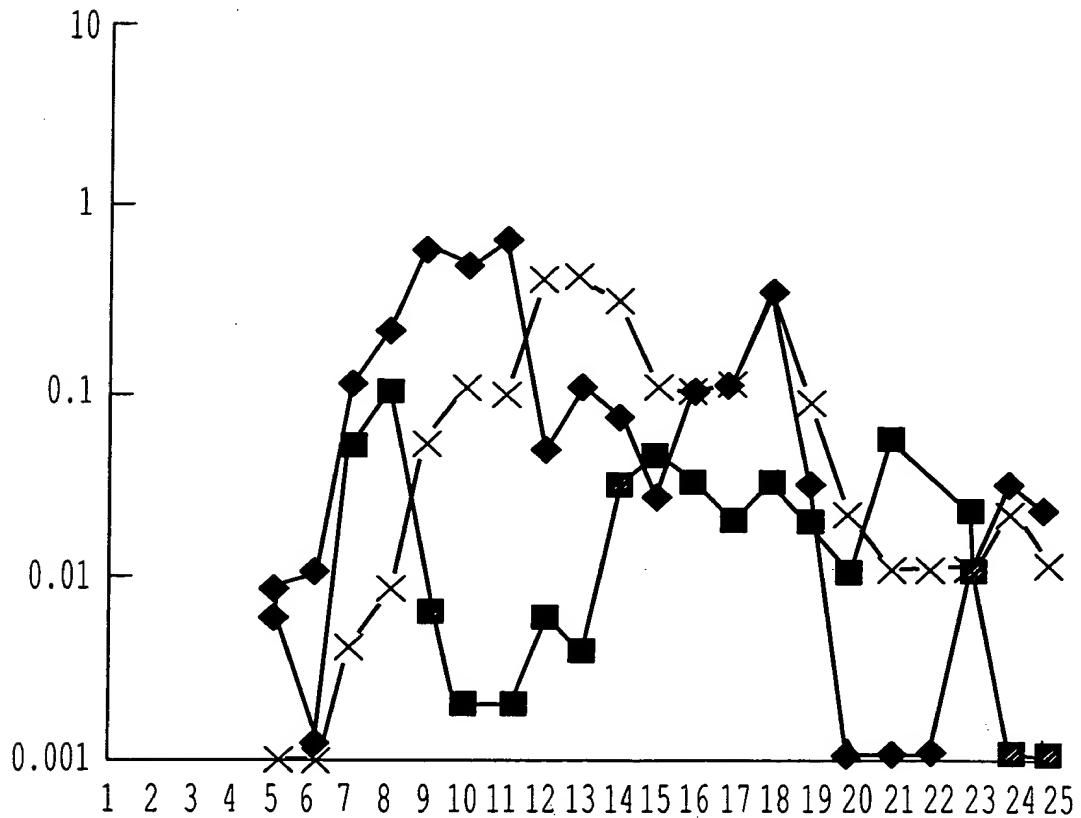


FIG. 6B

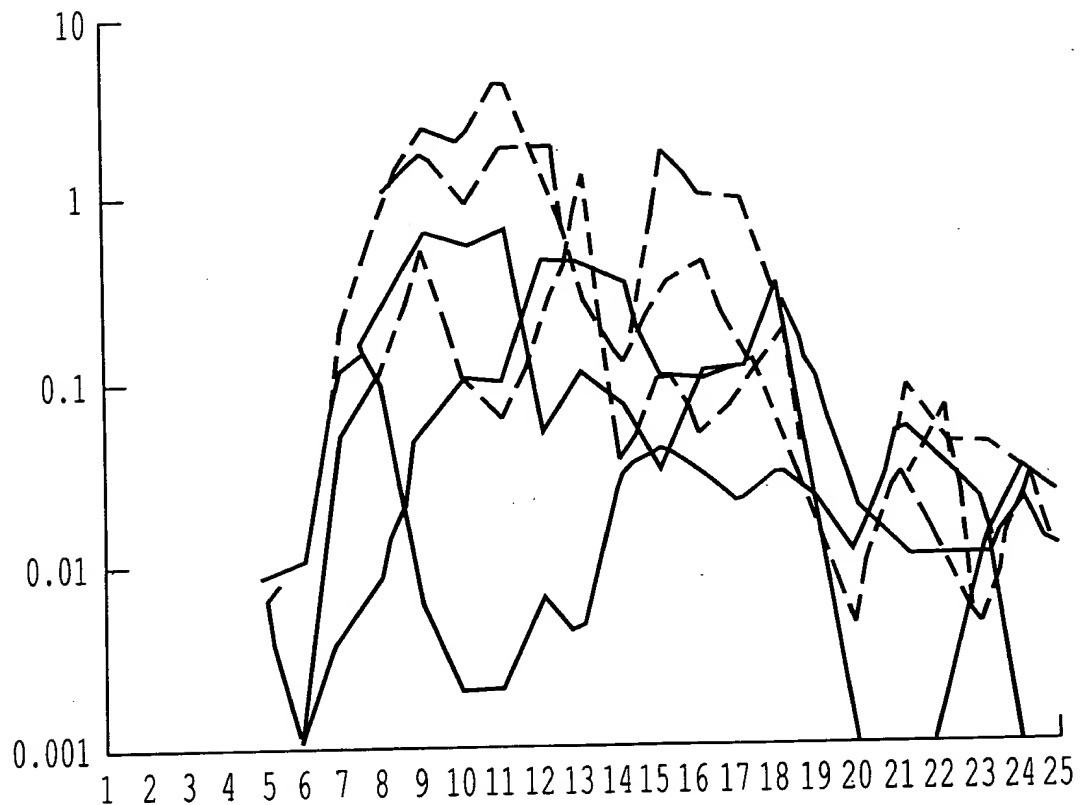


FIG. 6C

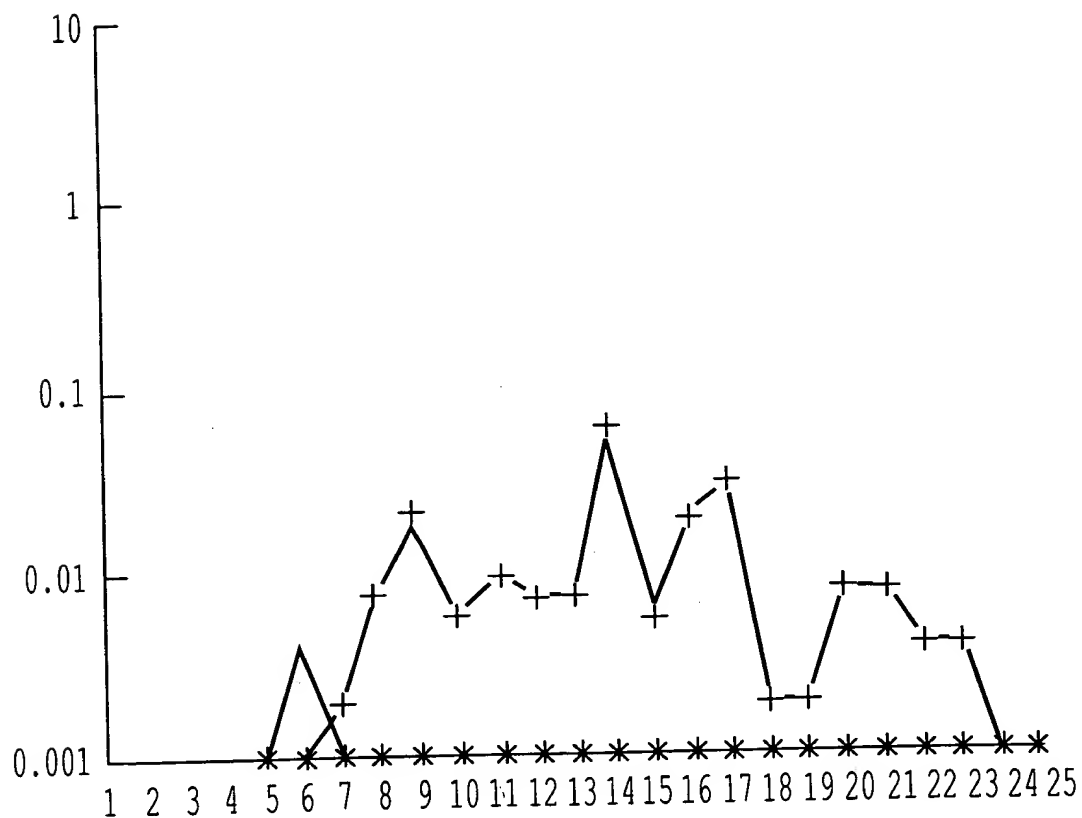


FIG. 6D

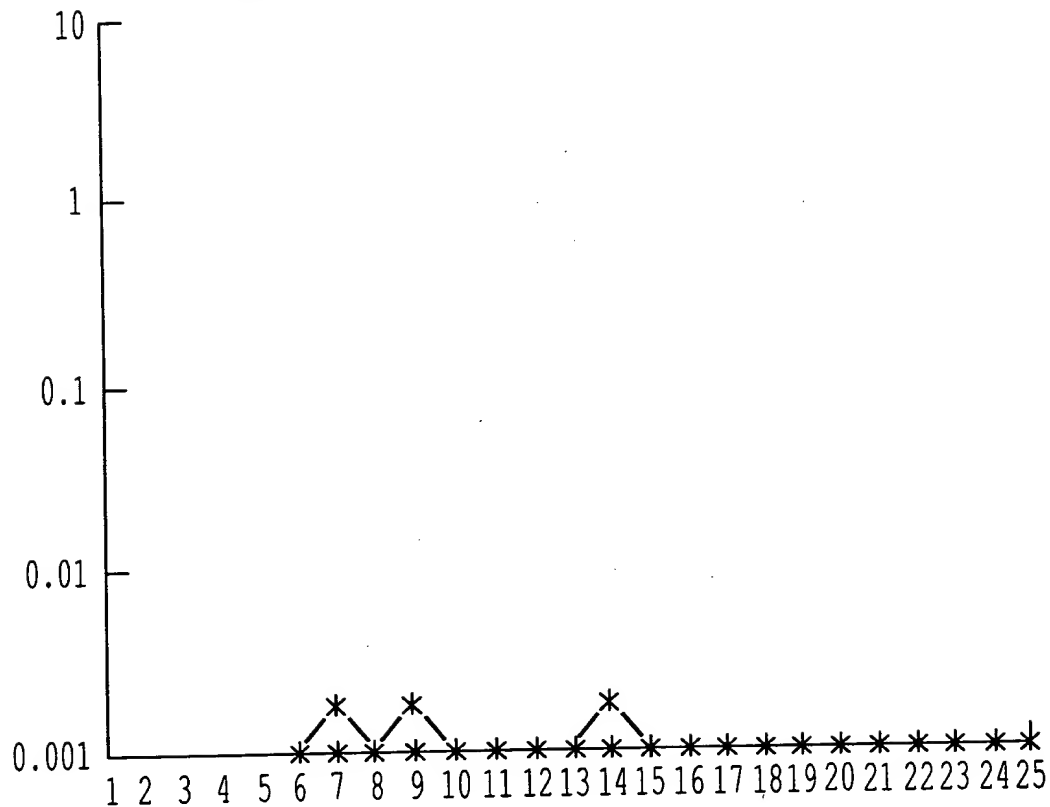


FIG. 6E

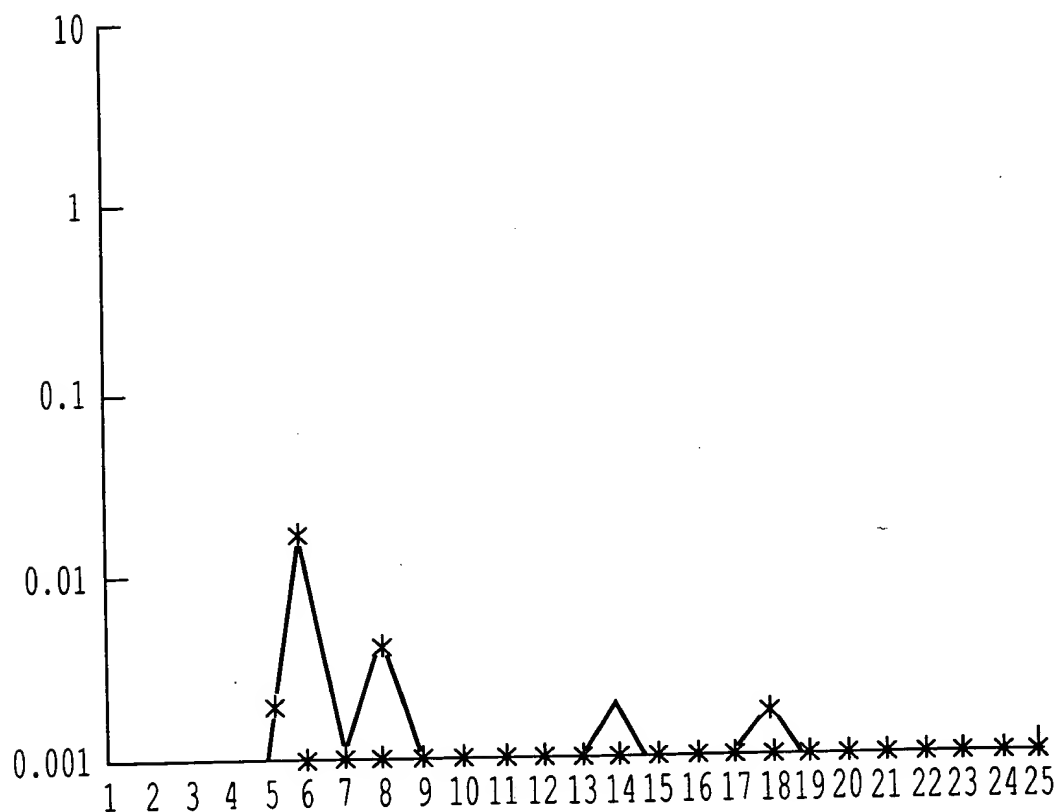


FIG. 6F

VACCINATION TEST: RECOMBINANT MSP-1 (P42 AND P19) FROM
PLASMODIUM CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE

YEAR	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
MONTH	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
DAY	19	20	21	22	23	24	25	26	27	28	29	30	31	16	17	17	17	17
DAYS POST-INFECTION	5	6	7	8	9	10	11	12	13	14	15	16	17	16	17	17	17	17
VACCINATION T434	-	.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p42	-	-	.002	.008	.02	.006	.01	.008	.008	.06	.02	.03	.002	.03	.002	.03	.002	.002
T428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VACCINATION T429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p19	-	-	.002	-	-	-	-	-	-	.002	-	-	-	-	-	-	-	-
T426	-	-	.002	-	-	-	-	-	-	.002	-	-	-	-	-	-	-	-
T455	-	-	-	.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VACCINATION T430	-	.02	-	-	-	-	-	-	-	.002	-	-	-	-	-	-	-	-
p42+p19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.002
T431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T433	.002	-	-	.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS	T425	.006	-	.05	0.1	.006	.002	.002	.006	.004	.03	.04	.03	.02	.03	.02	.03	.03
PHYSIOLOGICAL WATER	T436	-	-	.004	.008	0.05	0.1	0.09	0.39	0.4	0.3	0.1	0.09	0.1	.3	0.1	.3	.3
FCA/FLAT	T438	.008	0.01	0.1	0.2	0.6	0.5	0.6	0.05	0.1	0.07	0.03	0.1	0.1	.32	0.1	.32	.32
CONTROLS	T437	.004	.008	0.2	0.1	0.4	0.1	0.06	0.2	1.0	0.03	0.1	0.05	0.08	.17	0.08	.17	.17
NON VACCINATED	T440	.006	.01	0.1	1.04	1.5	1.8	1.6	1.5	0.3	0.12	0.28	0.4	0.12	.12	0.4	.12	.12
T441	.004	.008	0.2	0.8	2.1	2.1	1.7	3.8	1.04	0.27	0.1	1.5	0.9	0.9	.16	0.9	.16	.16

- = ABSENCE OF PARASITES IN 400 MICROSCOPIC FIELDS

FIG. 6G.1

CONTINUED

TO

FIG. 6G.2

FIG. 6G.2

FIG. 6G.2

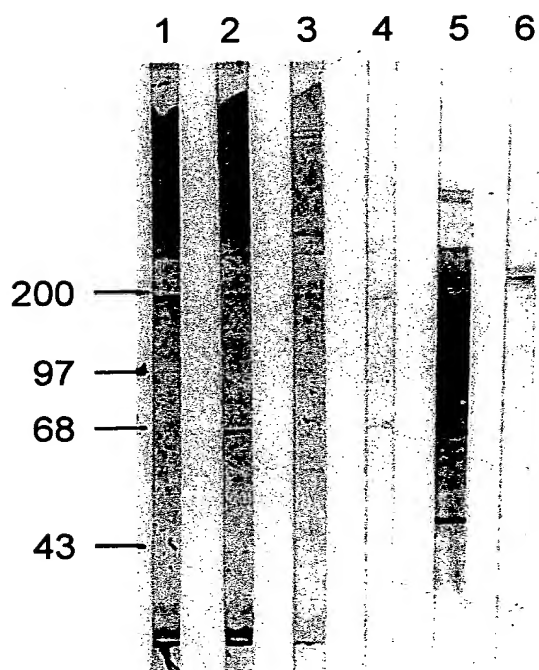


FIG. 7A

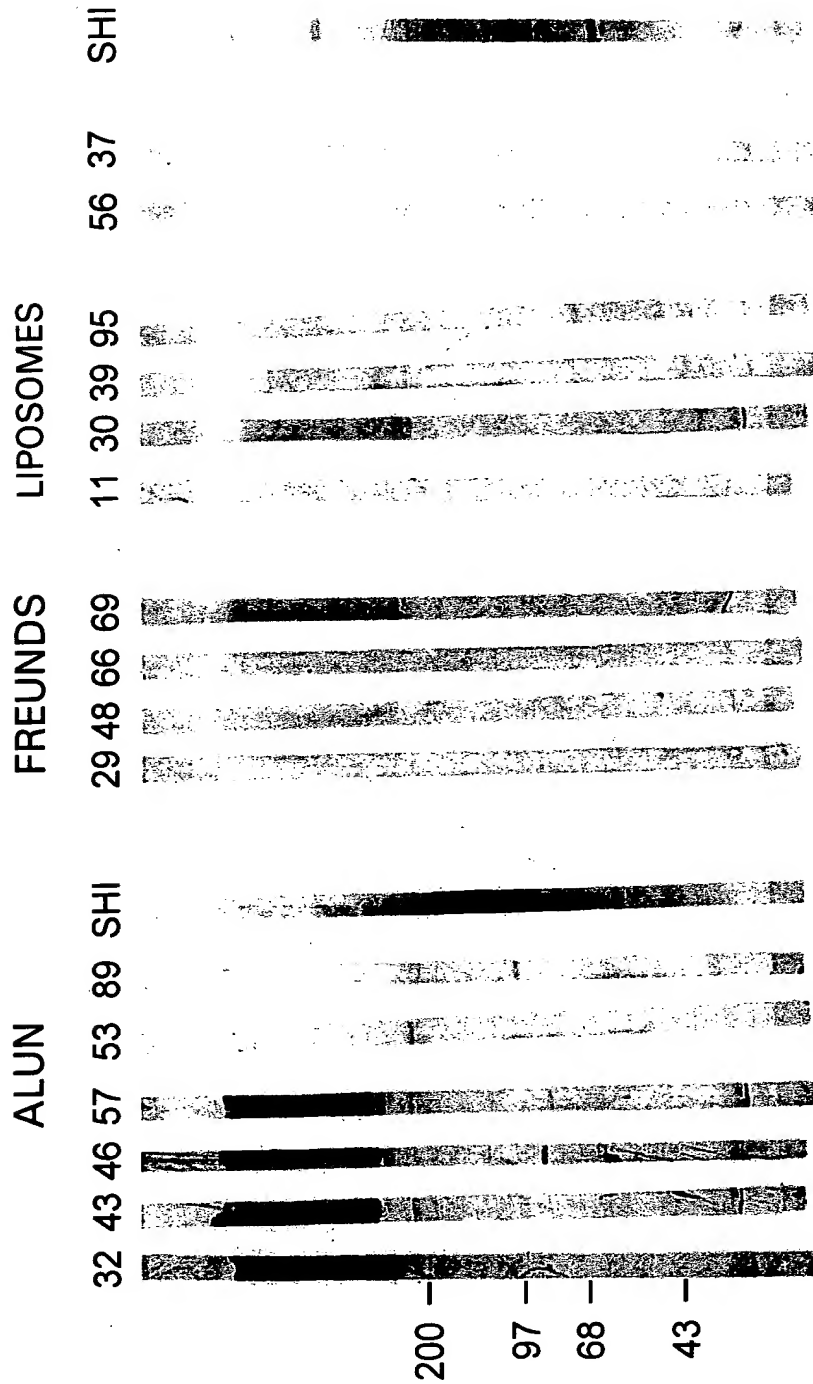


FIG. 7B

VACCINATION TEST: RECOMBINANT MSP-1 (P19) OF PLASMODIUM CYNOMOLGI IN
THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION

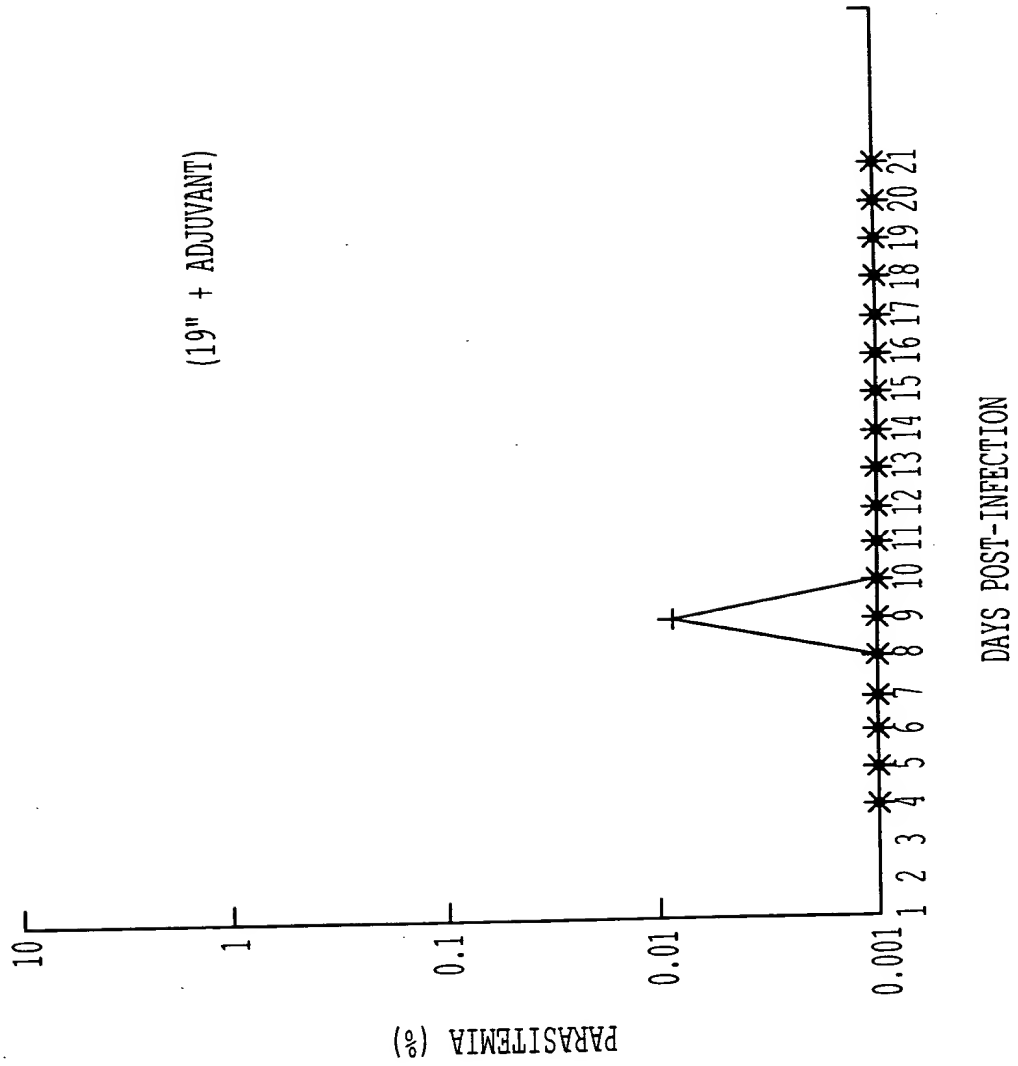


FIG. 8A

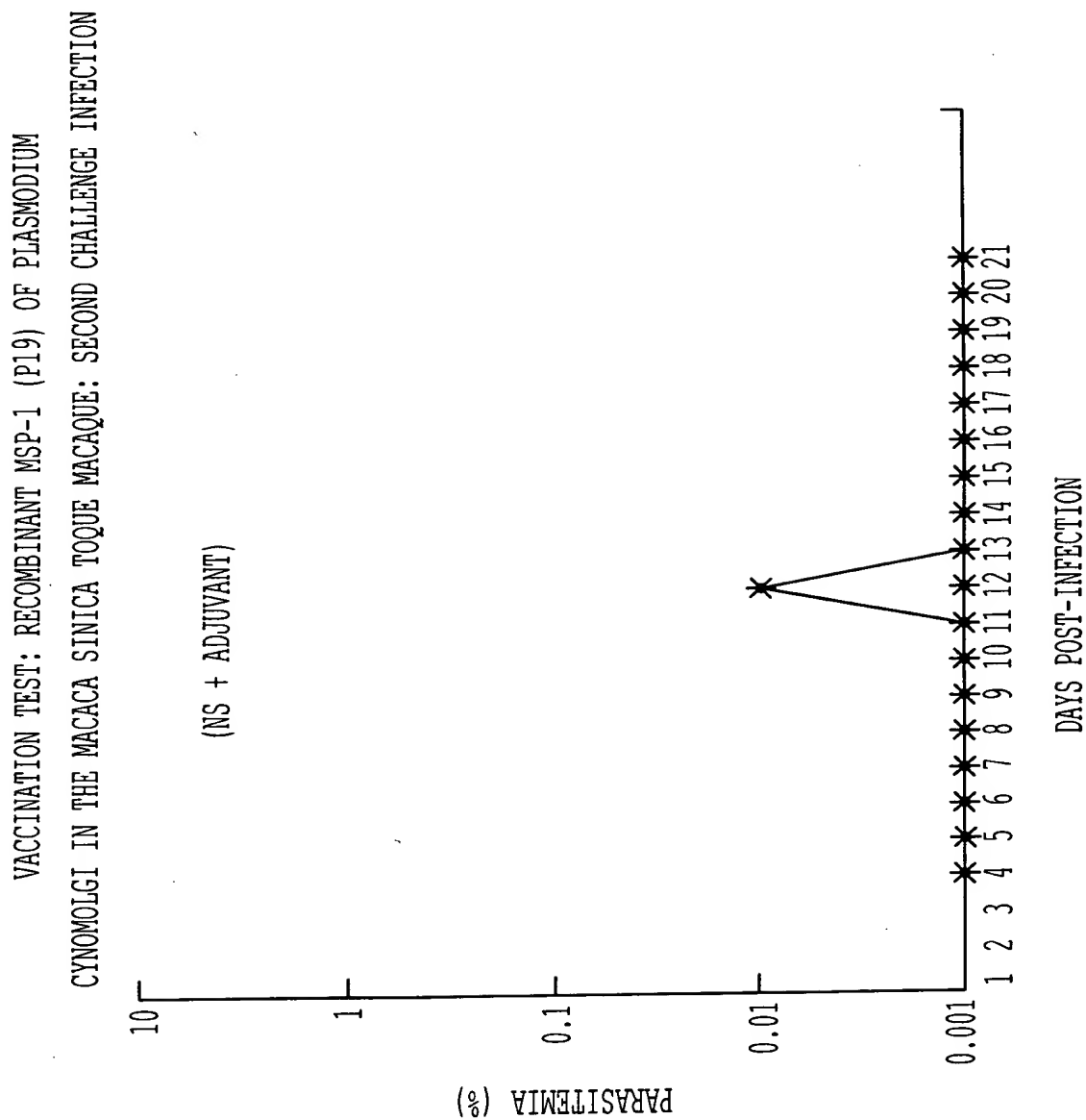


FIG. 8B

VACCINATION TEST: RECOMBINANT MSP-1 (P19) OF PLASMODIUM
CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION

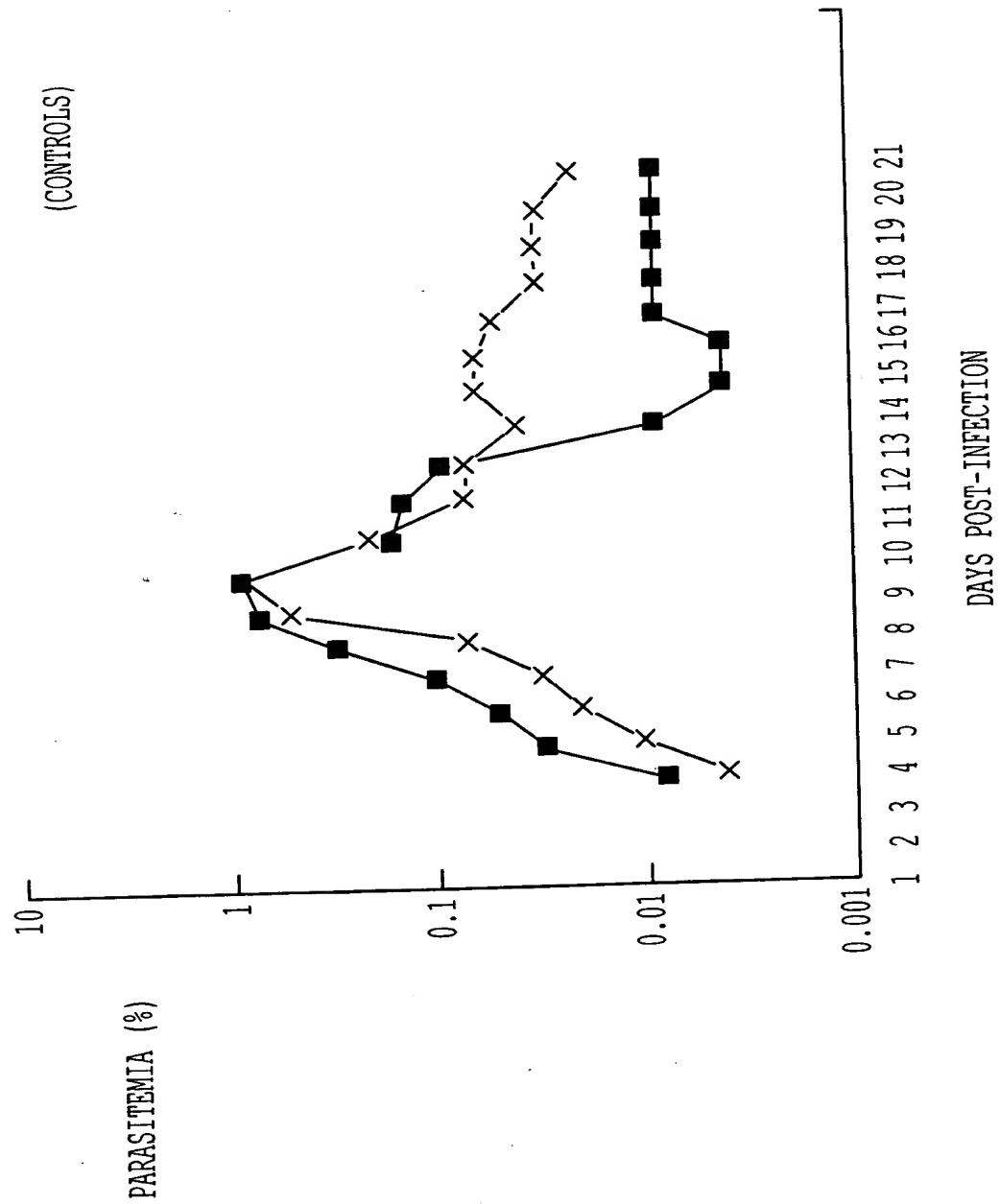


FIG. 8C

VACCINATION TEST: RECOMBINANT MSP-1 (p19) OF PLASMODIUM
CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION

YEAR	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MONTH	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
DAYS POST-INFECTION	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21
DAYS AFTER CHALLENGE	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	21
VACCINATION p19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T426	-	-	-	-	-	-	.008	-	-	-	-	-	-	-	-	-	-	-	-	-
T427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHYSIOLOGICAL WATER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FCA/FLA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T436	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T425	-	-	-	-	-	-	-	-	.008	-	-	-	-	-	-	-	-	-	-	-
T438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON VACCINATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T448	.008	.03	.05	.01	.03	.07	.03	.07	.14	.09	.008	.004	.004	.008	.008	.008	.008	.008	.008	.008
T449	.004	.01	.02	.03	.07	.05	.08	.02	.07	.07	.04	.06	.06	.05	.03	.03	.03	.03	.03	.02

- = ABSENCE OF PARASITES IN 400 MICROSCOPIC FIELDS

FIG. 8D

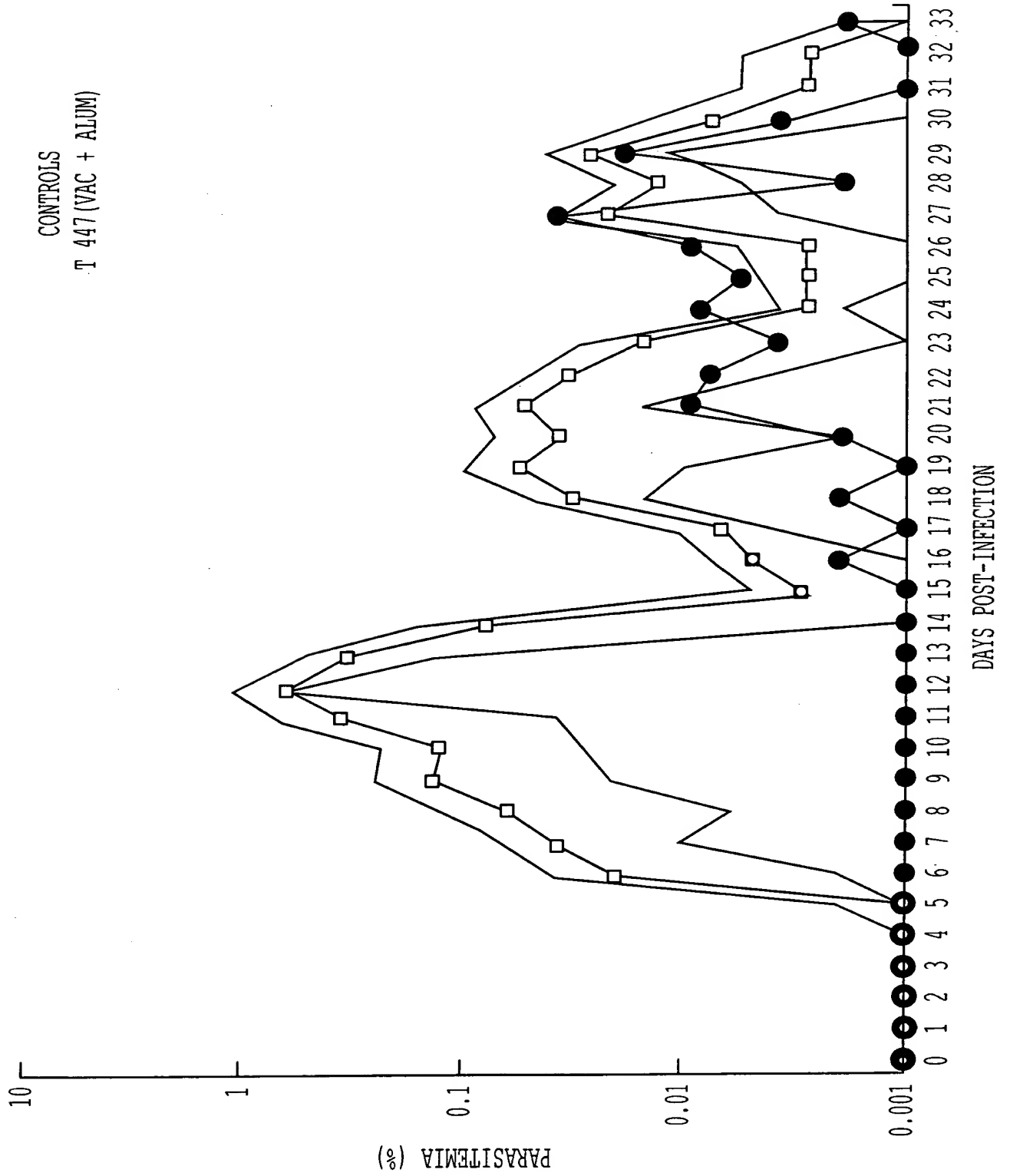


FIG. 9A

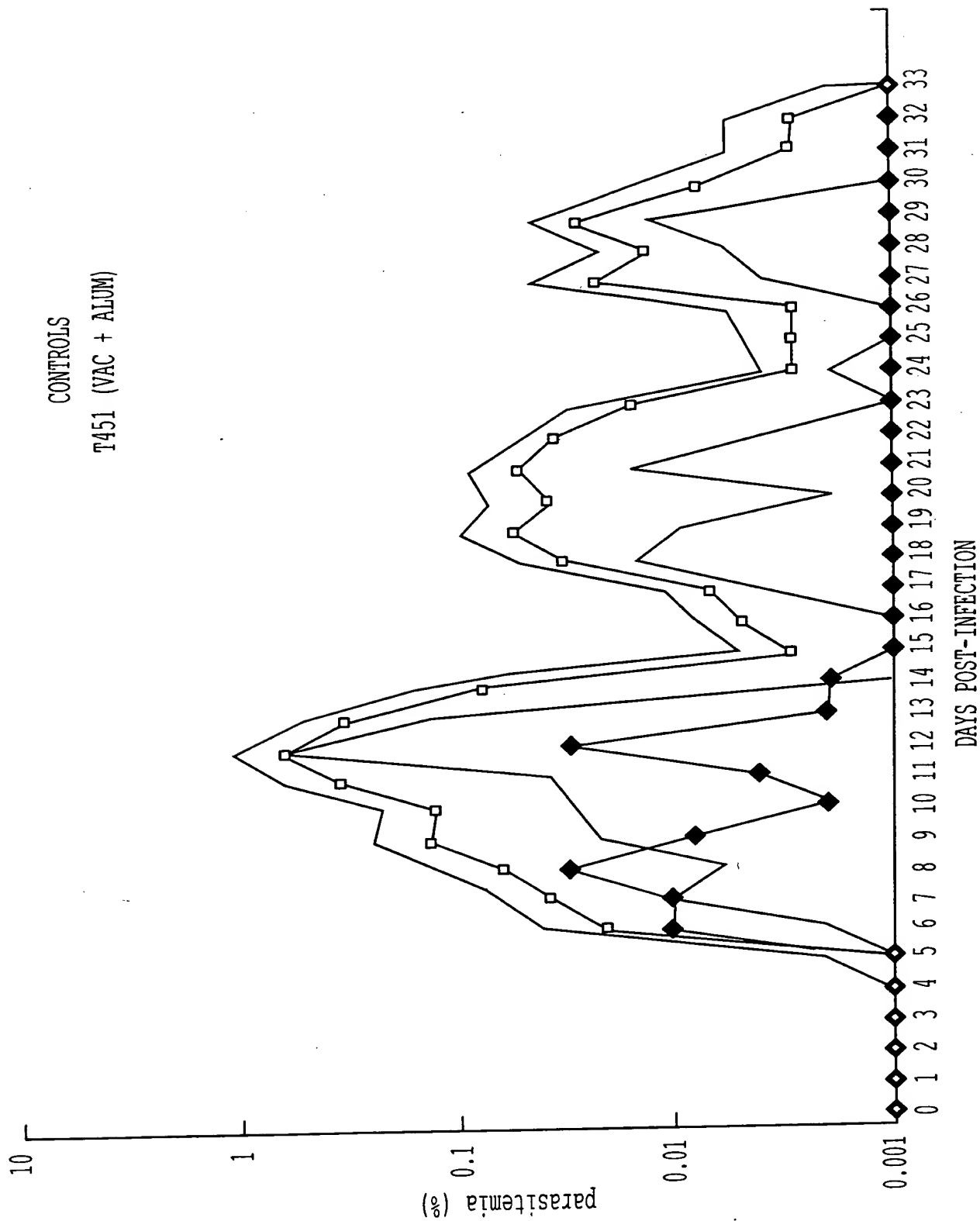


FIG. 9B

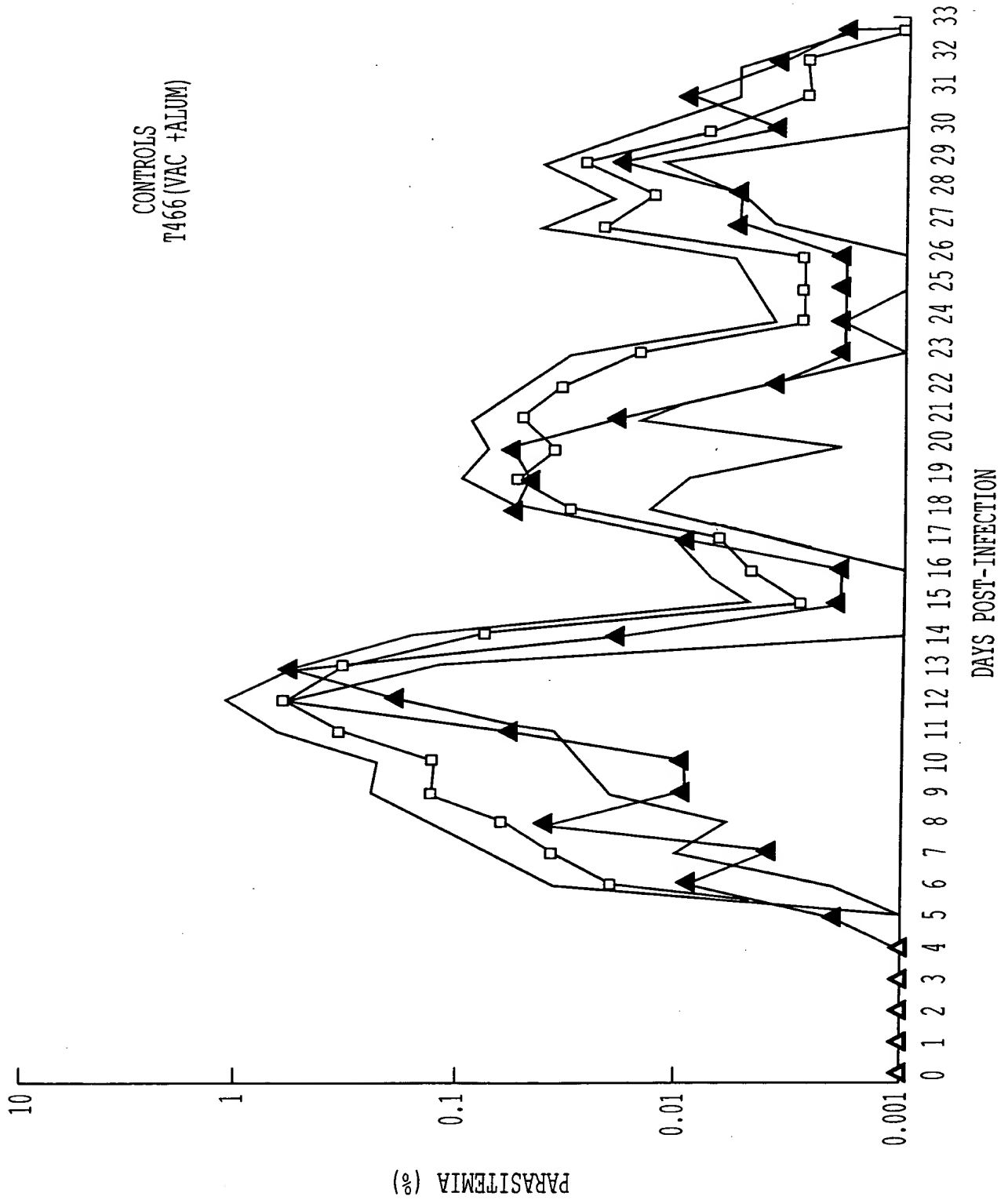


FIG. 9C

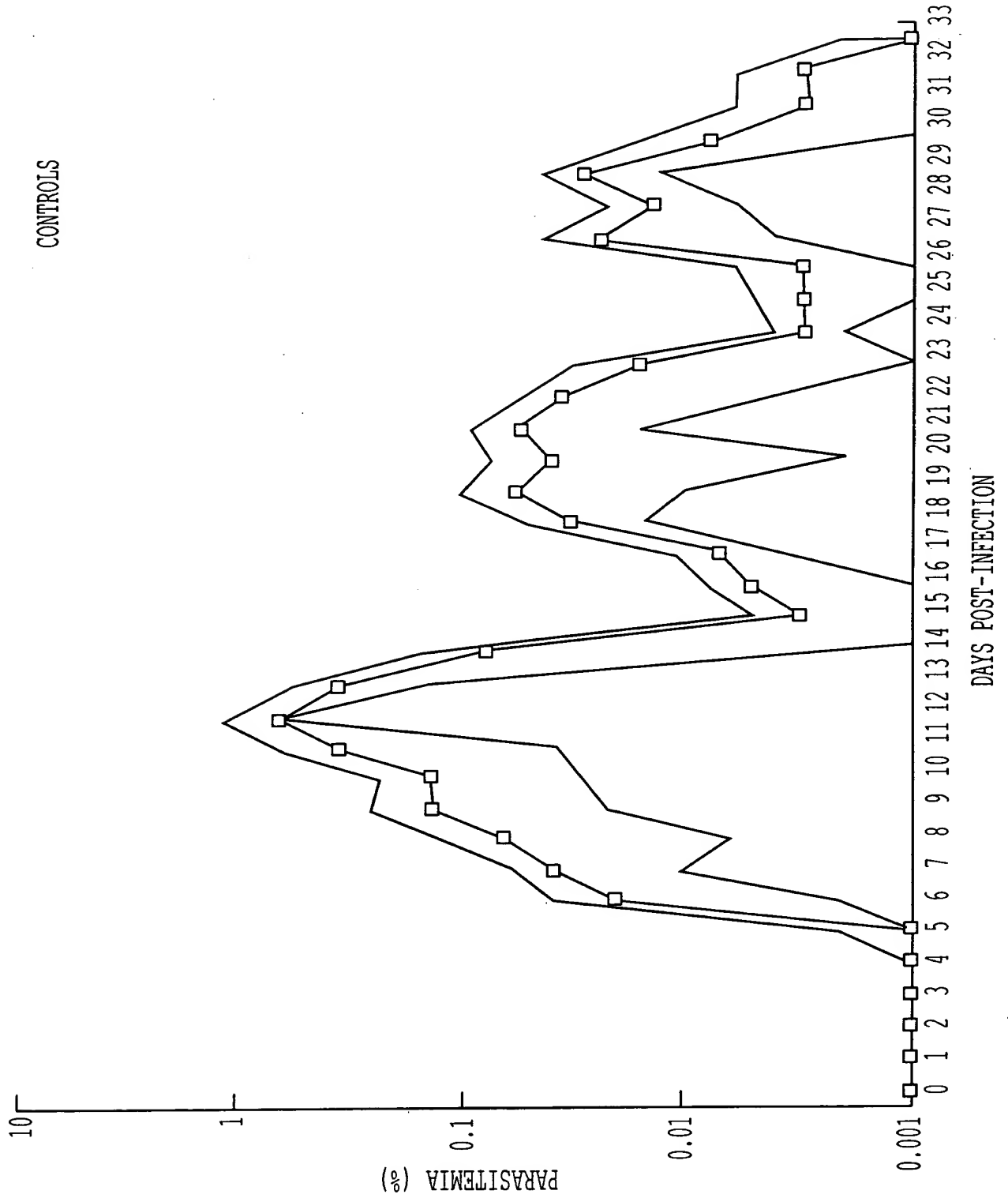


FIG. 9D

VACCINATION TEST: P. CYNOMOLGI/TOQUE MACAQUE WITH MSP-1 P19 OF P.

CYNOMOLGI IN ALUM

YEAR	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MONTH	7	7	7	7	7	7	7	7	7	7	7	7	7	7
DAY	17	18	19	20	21	22	23	24	25	26	27	28		
	5	6	7	8	9	10	11	12	13	14	15	16		

GROUP 1

(19" + ALUM)

T446	0.002	0.009	0.004	0.04	0.01	0.01	0.06	0.2	0.6	0.02	0.002	0.002		
T447	-	-	-	-	-	-	-	-	-	-	-	-	0.002	
T450	-	0.01	0.01	0.01	0.006	0.002	0.004	0.03	0.002	0.002	-	-	-	

CONTINUED ON
TO FIG 9E.2

GROUP 2

(NS + ALUM)

T450	0.002	0.01	0.05	0.04	0.12	0.04	0.12	0.2	0.12	0.02	0.006	0.01		
T454	0.002	0.05	0.06	0.14	0.3	0.28	0.08	13	0.063	0.02	0.002	0.002		
T455	-	-	-	0.008	0.05	0.08	0.14	0.4	0.3	0.2	0.002	0.002		

- NEGATIVE FOR PARASITES IN 400 MICROSCOPIC FIELDS

FIG. 9E. 1

FIG. 9E.2

PLASMODIU FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY
 MSP-1p19 VACCINATION WITH ALUM

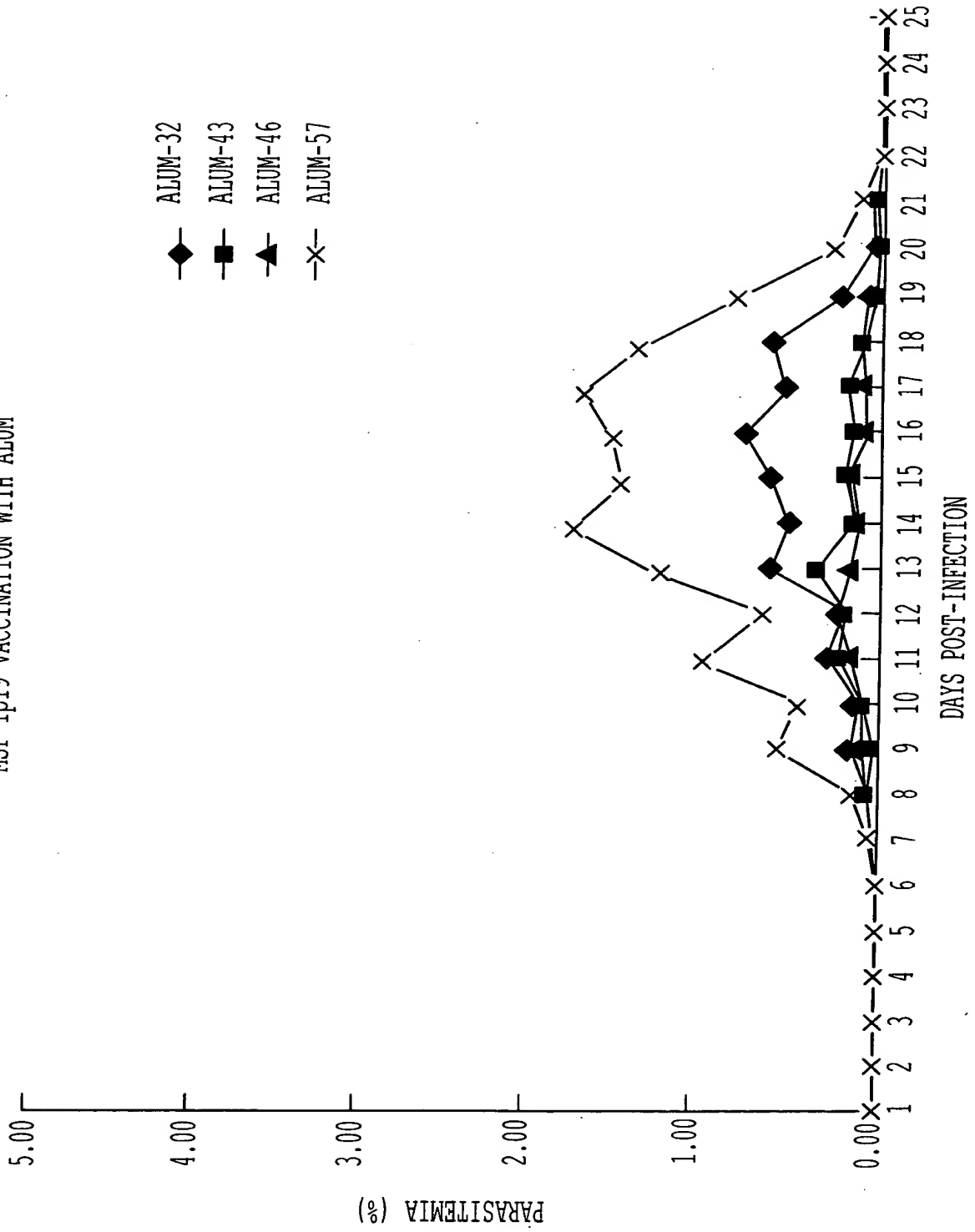


FIG. 10A

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

MSP-1 p19 VACCINATION WITH FREUNDS

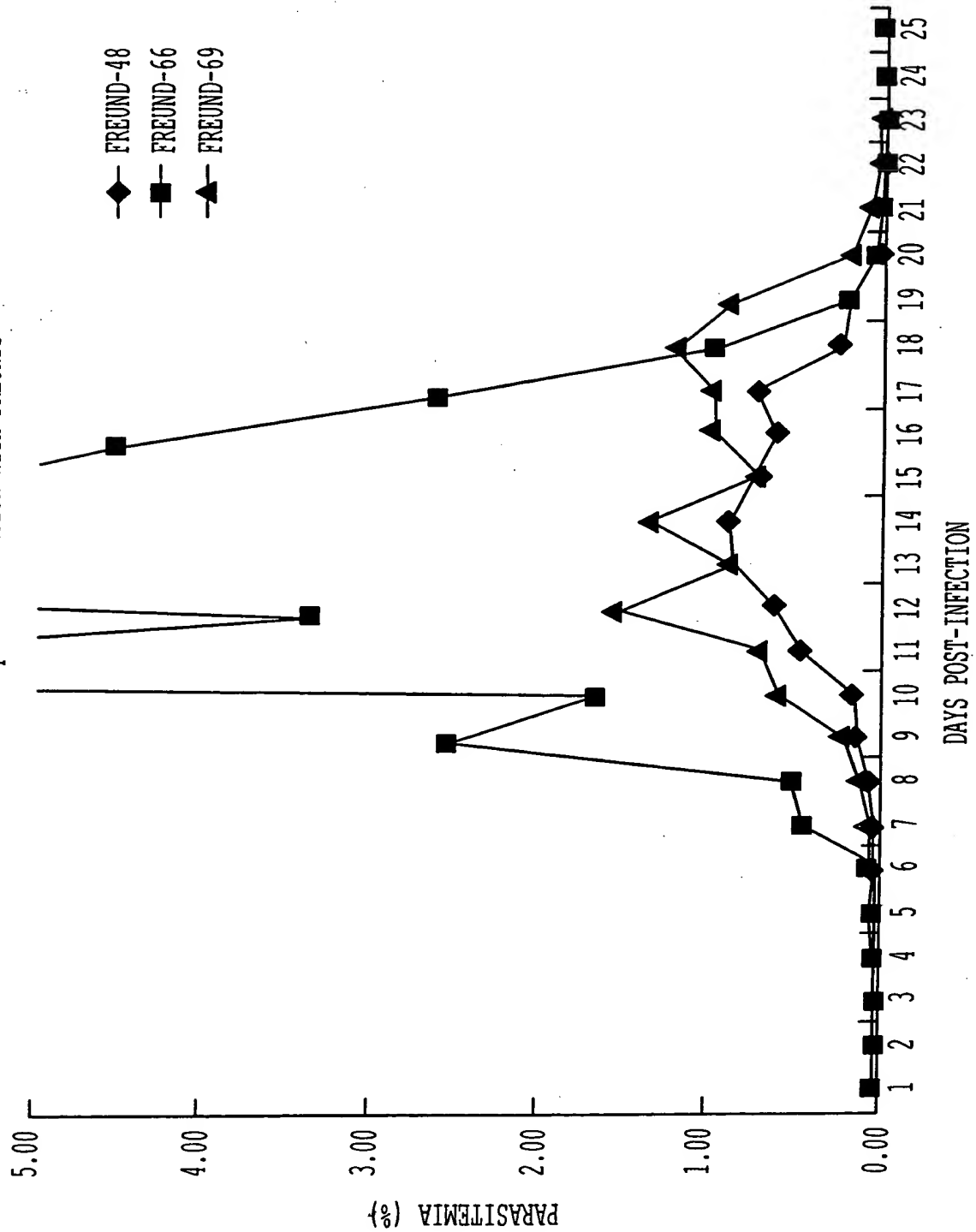


FIG. 10B

PLASMODIU FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY
MSP-1 p19 VACCINATION WITH LIPOSOMES

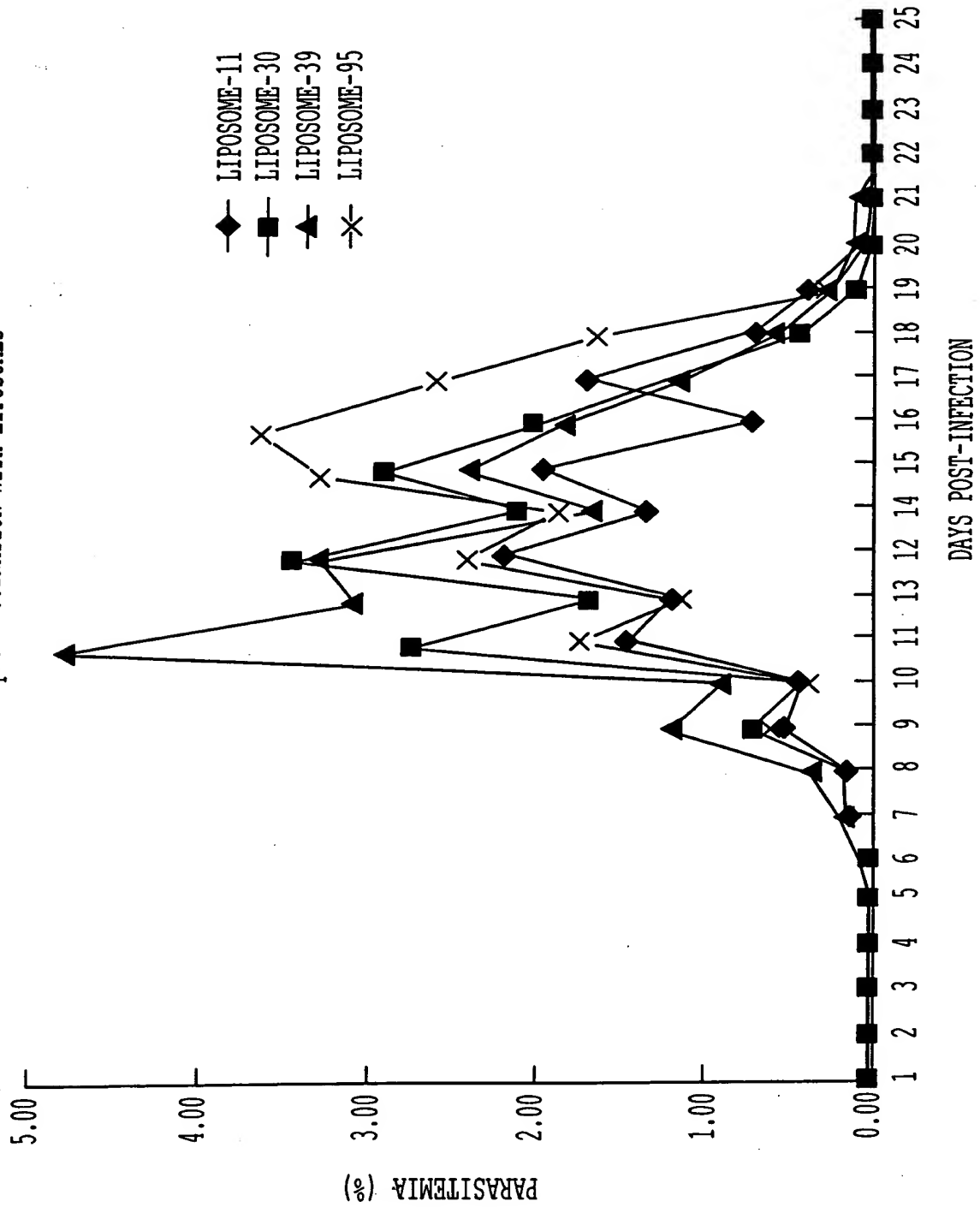


FIG. 10C

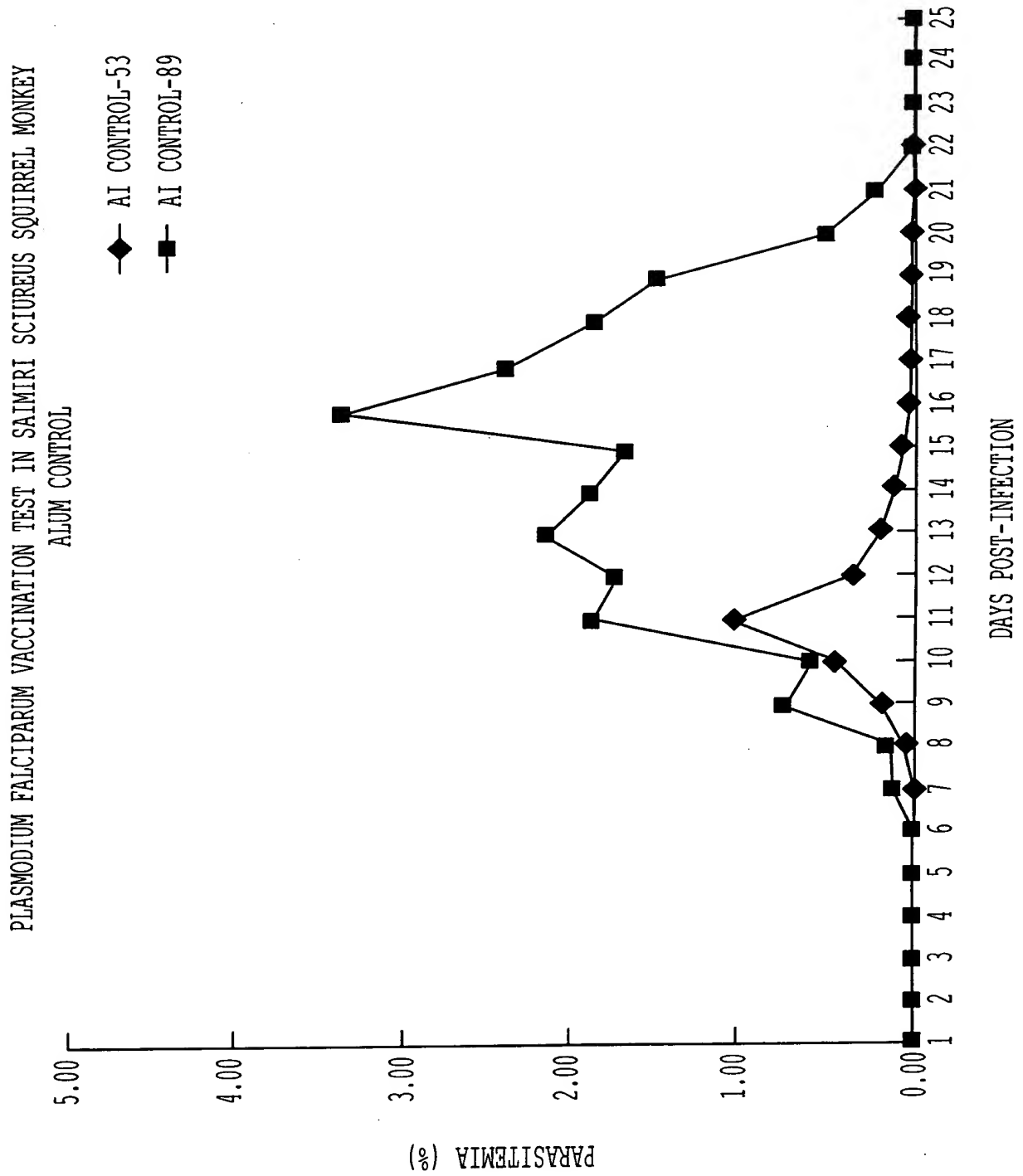


FIG. 10D

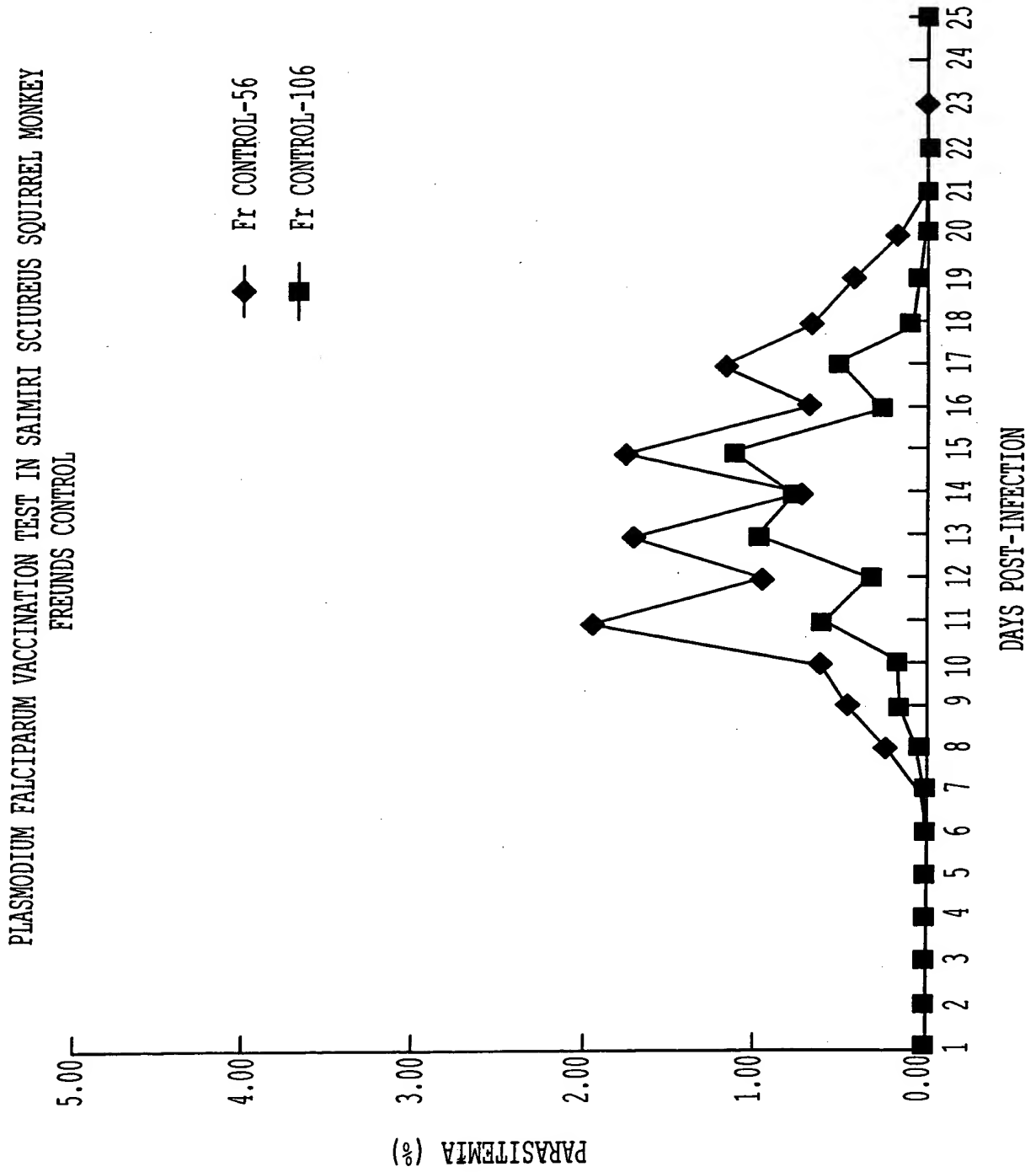


FIG. 10E

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

LIPOSOME CONTROL

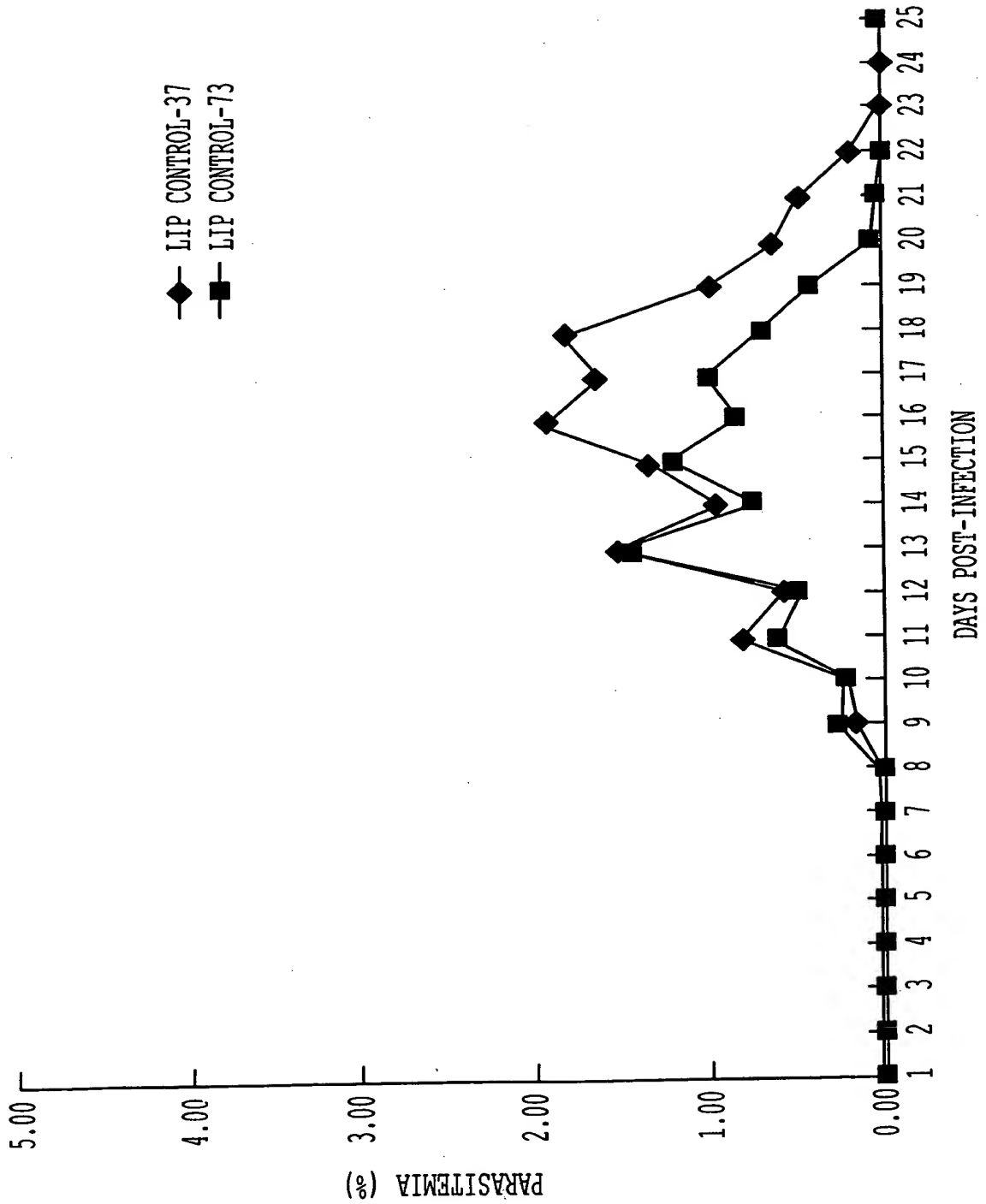


FIG. 10F

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

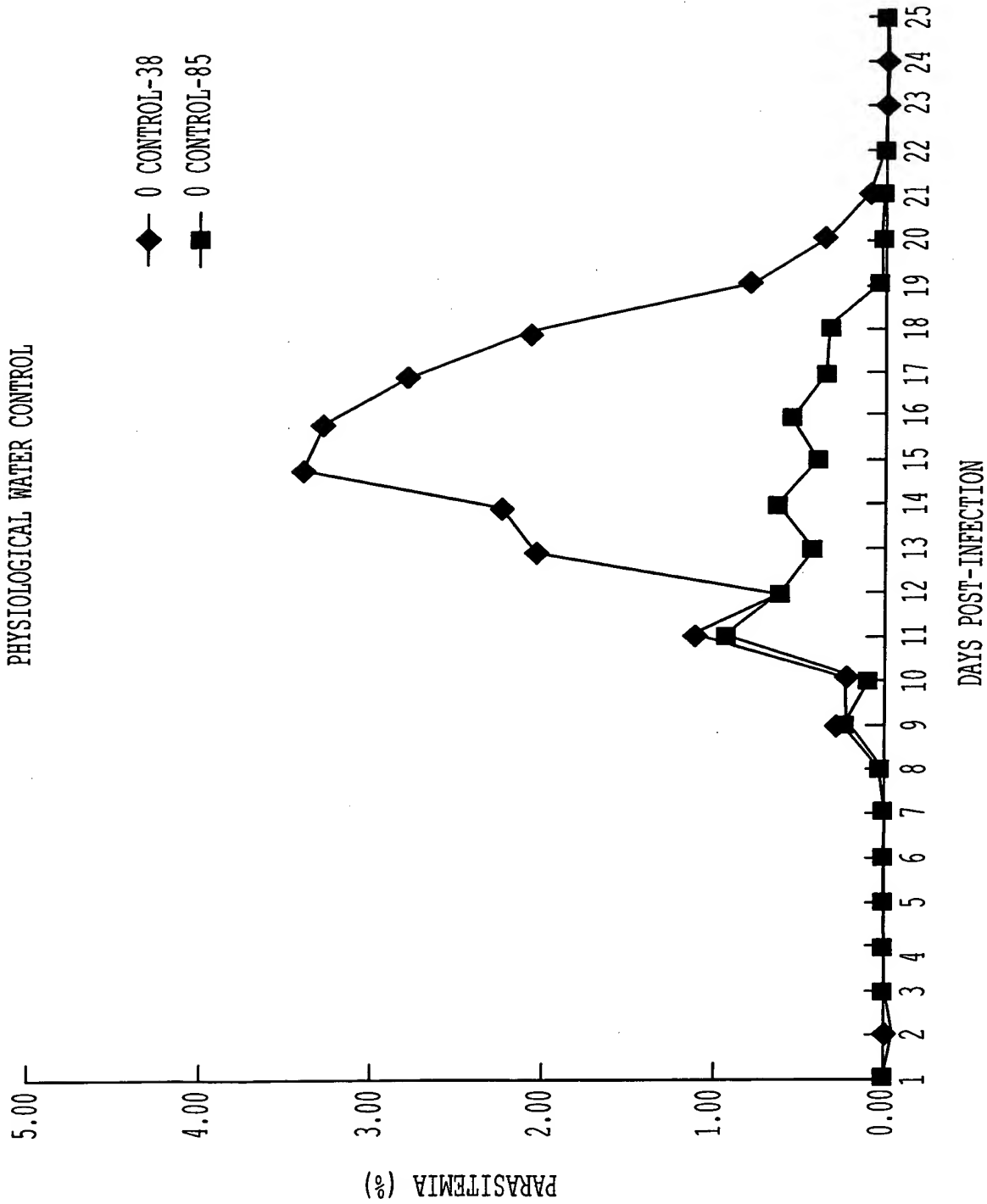
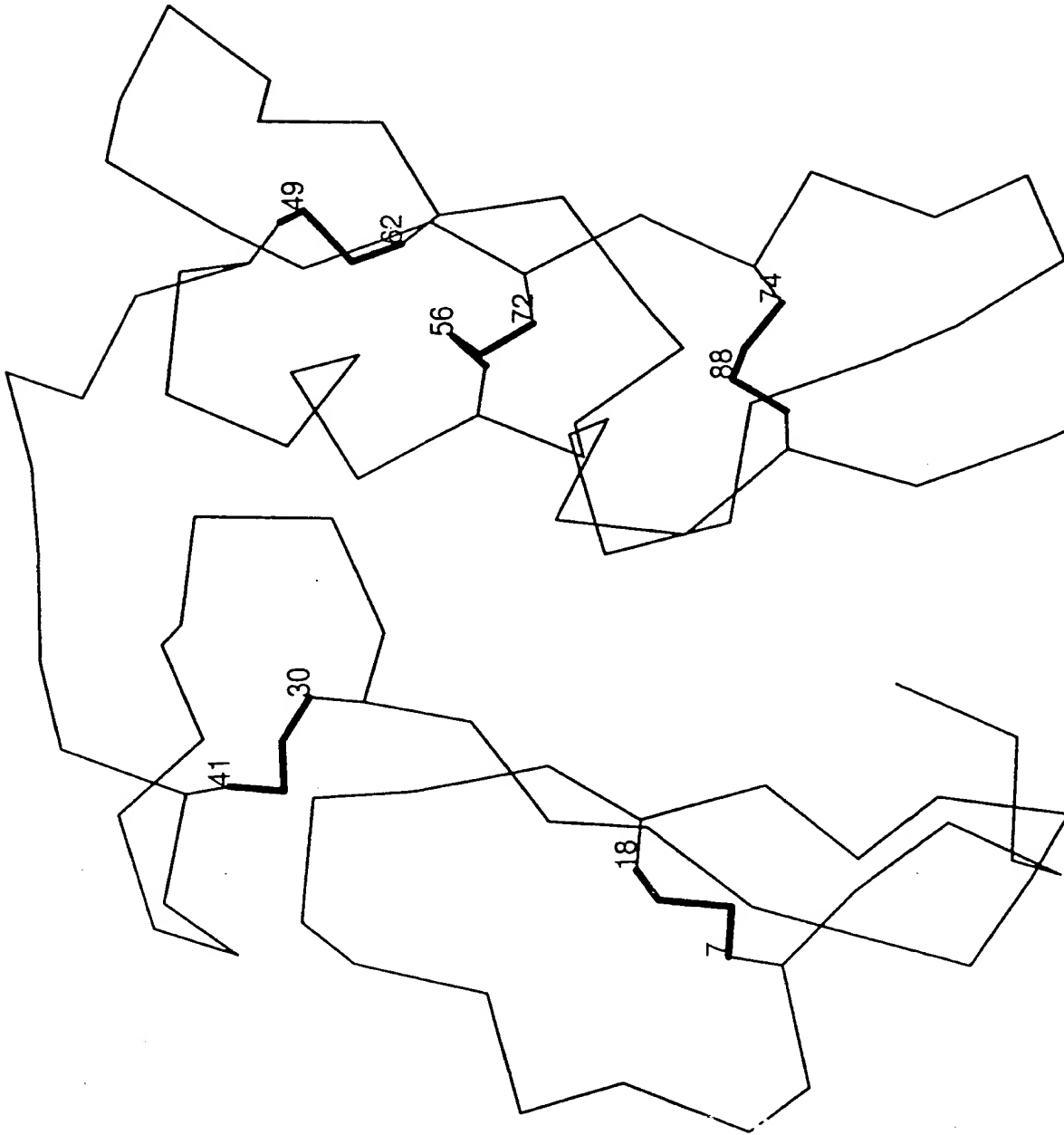


FIG. 10G

FIG. 11A



Backbone of MSP1(19) showing disulfide bridges in bold line

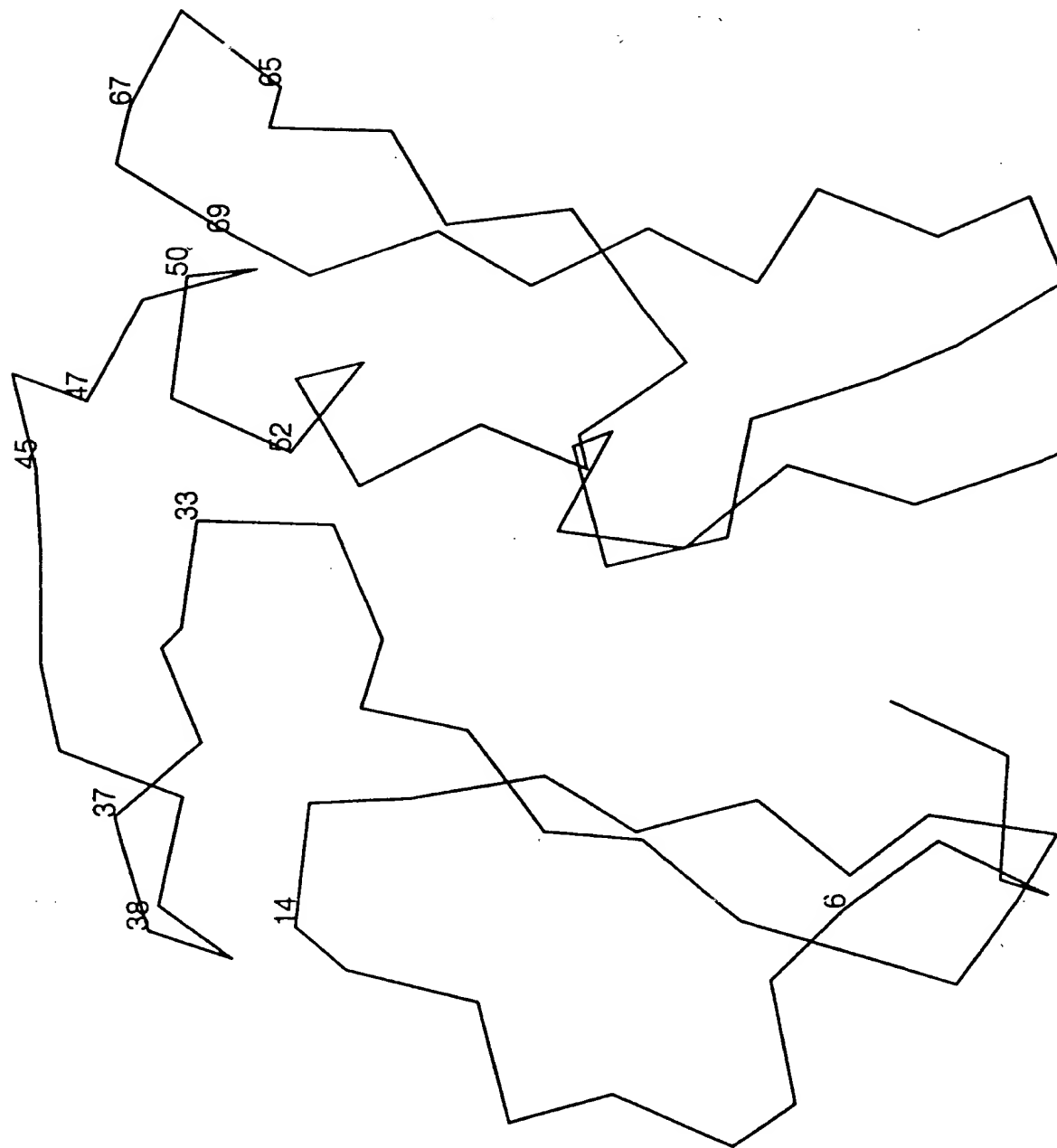


FIG. 11B

Backbone of MSP1(19) showing positions of sequence differences between *P. cynomolgi* and *P. vivax*.

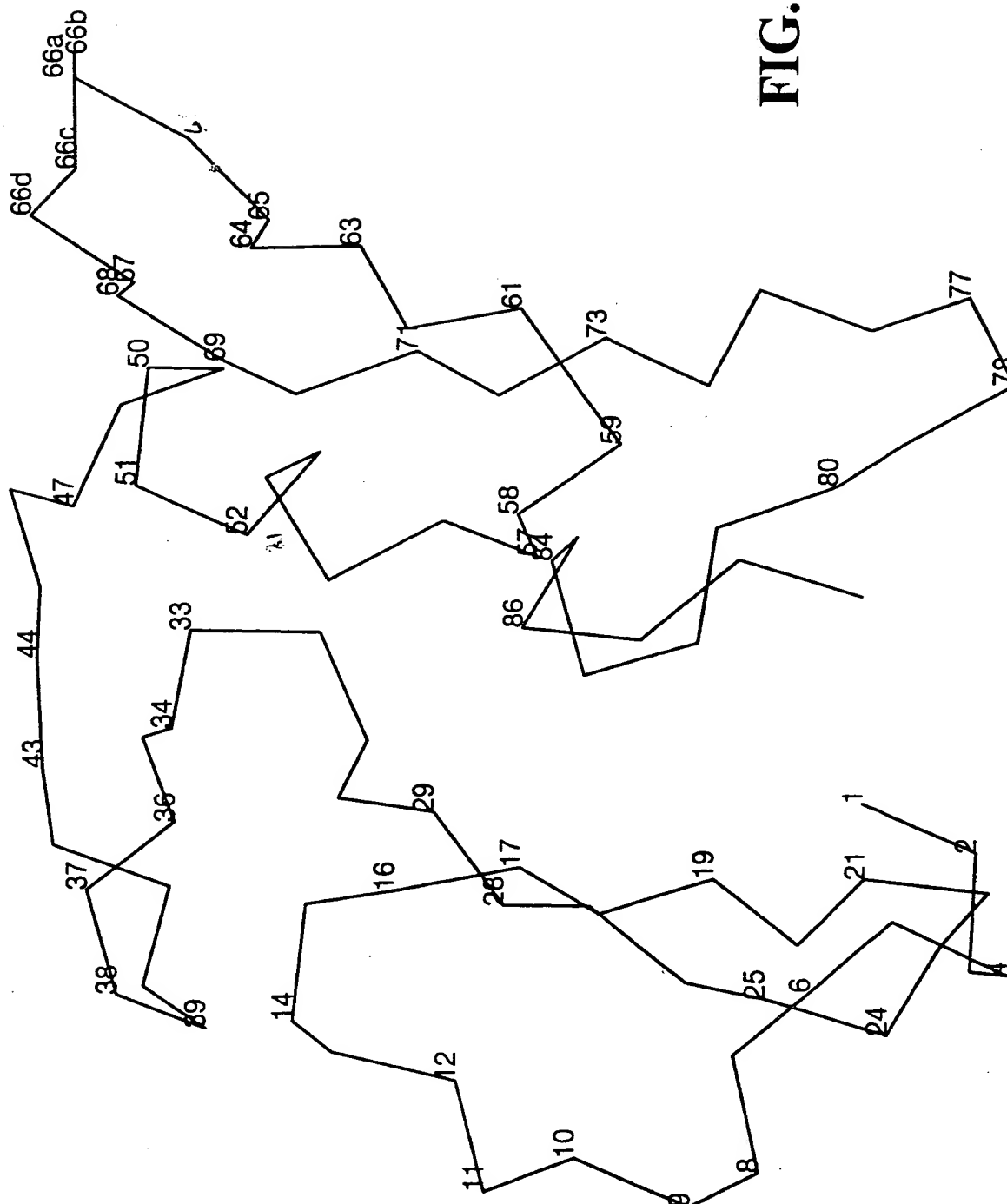


FIG. 11C

Backbone of homology-modelled MSP1(19) of *P. falciparum* with positions of sequence differences with *P. cynomolgi*

(RECONSTRUCTED MASS SPECTRA P. CYNOMOLGI)

1.03e7 cps

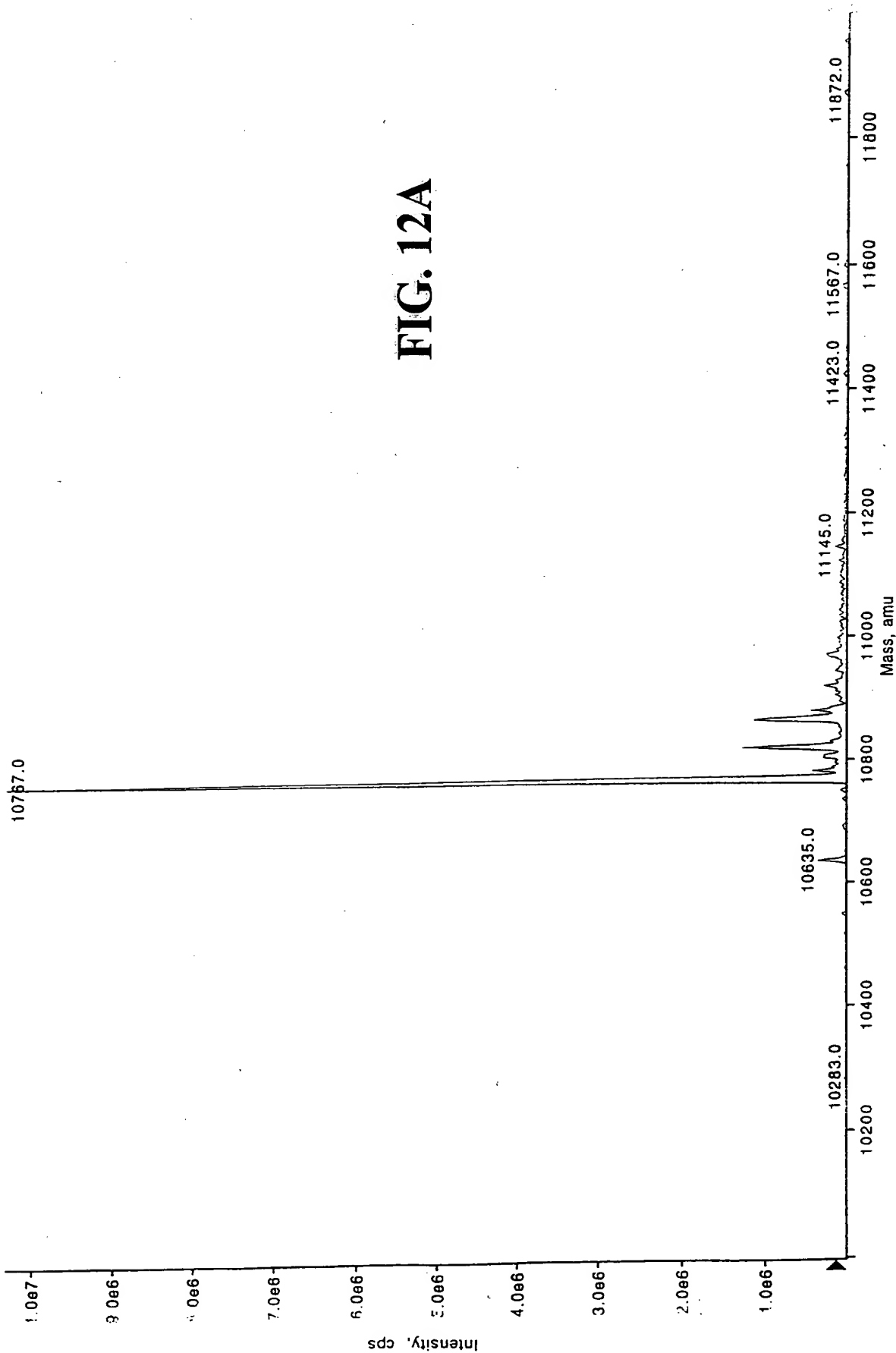
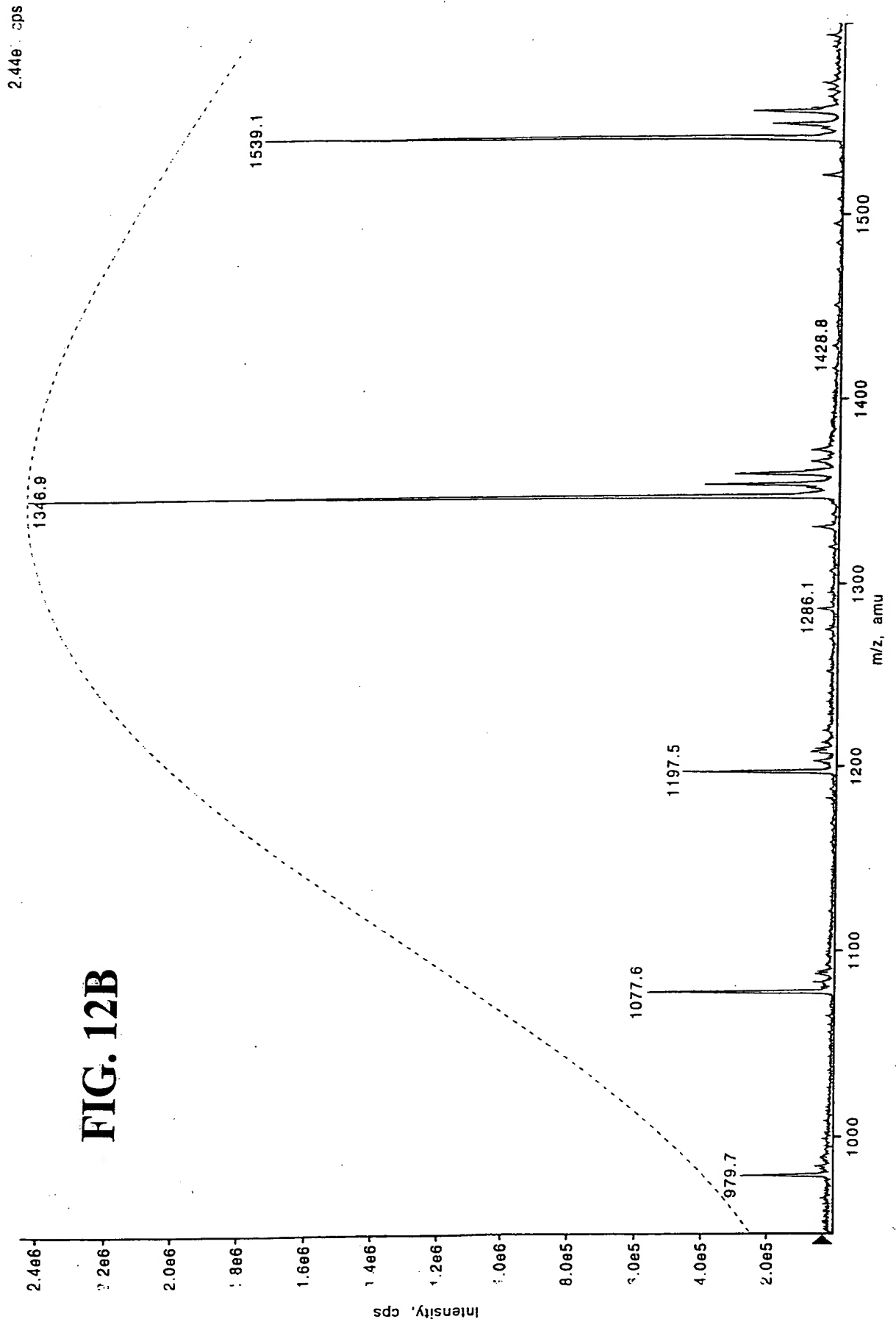


FIG. 12A

(m/z SPECTRA P. CYNOMOLGI)

FIG. 12B



(RECONSTRUCTED MASS SPECTRA P. FLACIPARUM)

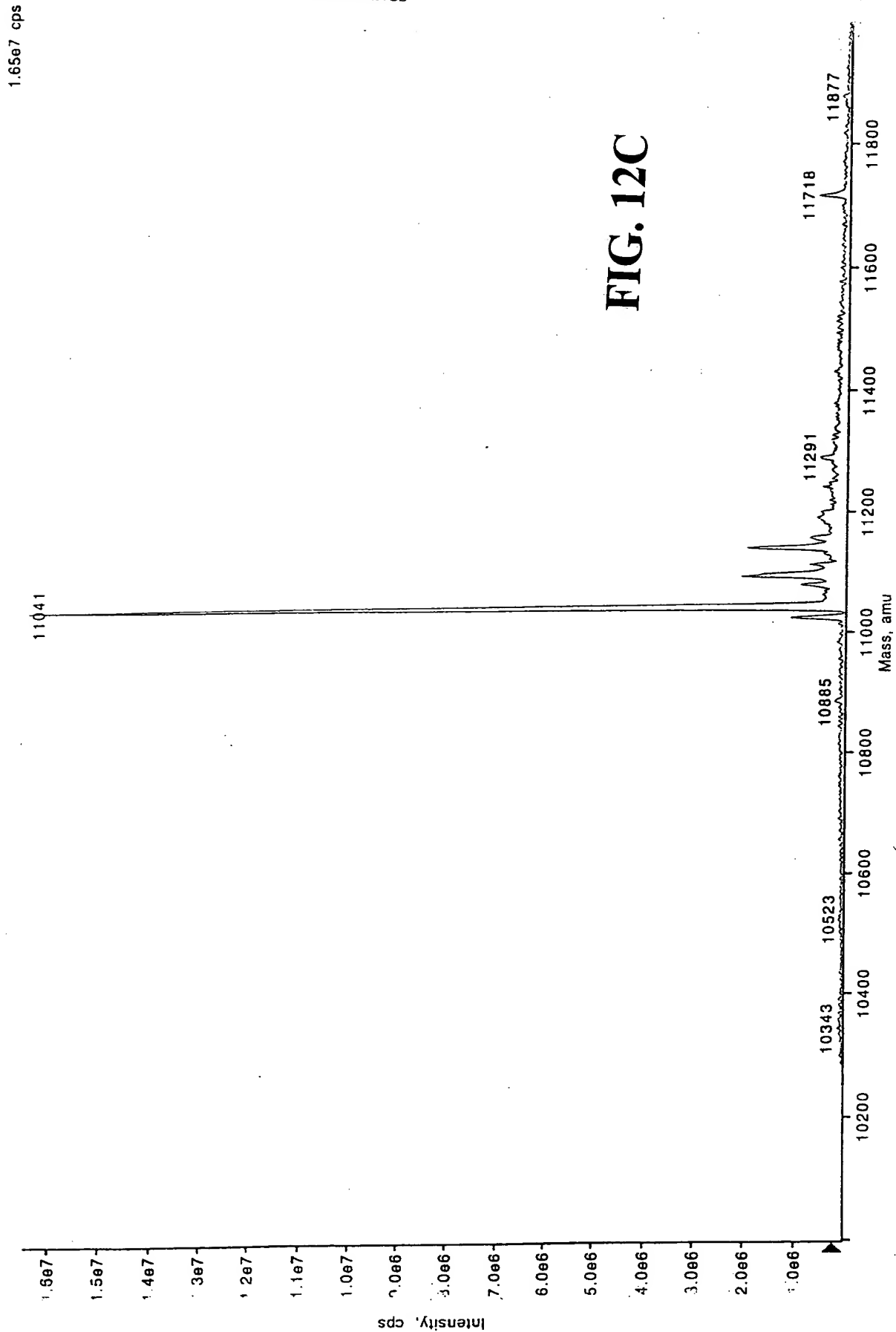
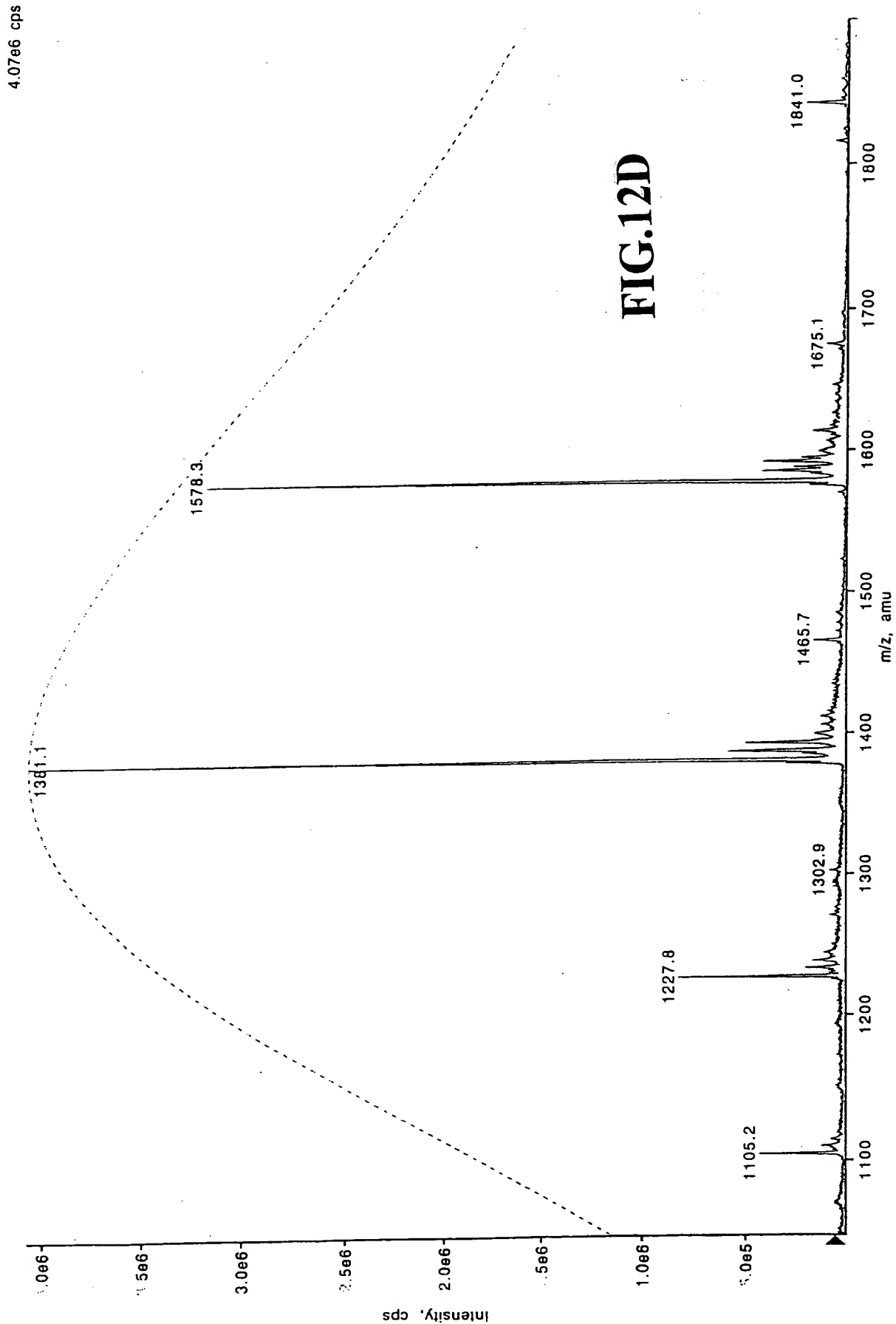


FIG. 12C

(m/z SPECTRA P. FALCIPARUM)



(RECONSTRUCTED MASS SPECTRA P.VIVAX)

1.97e7 cps

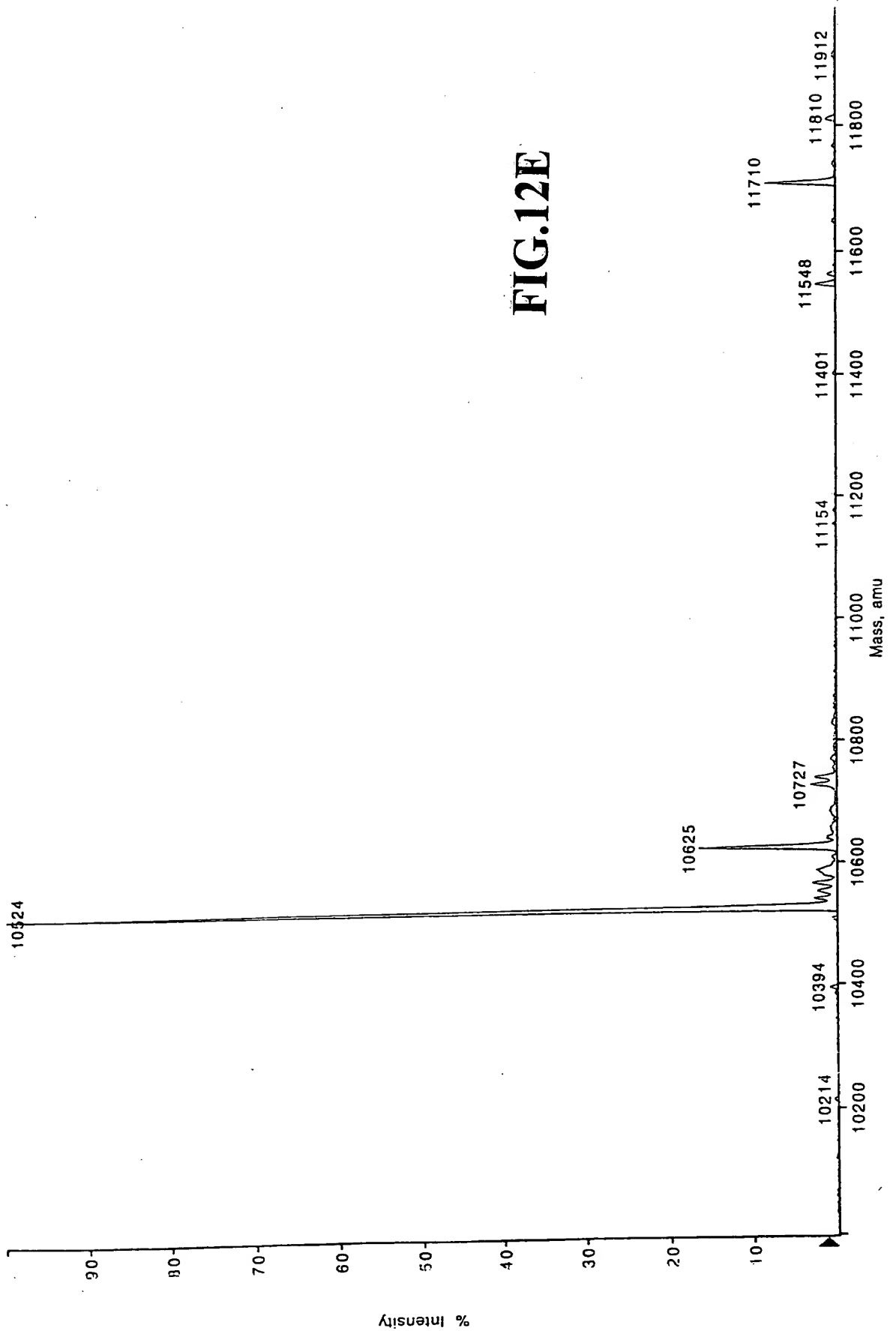


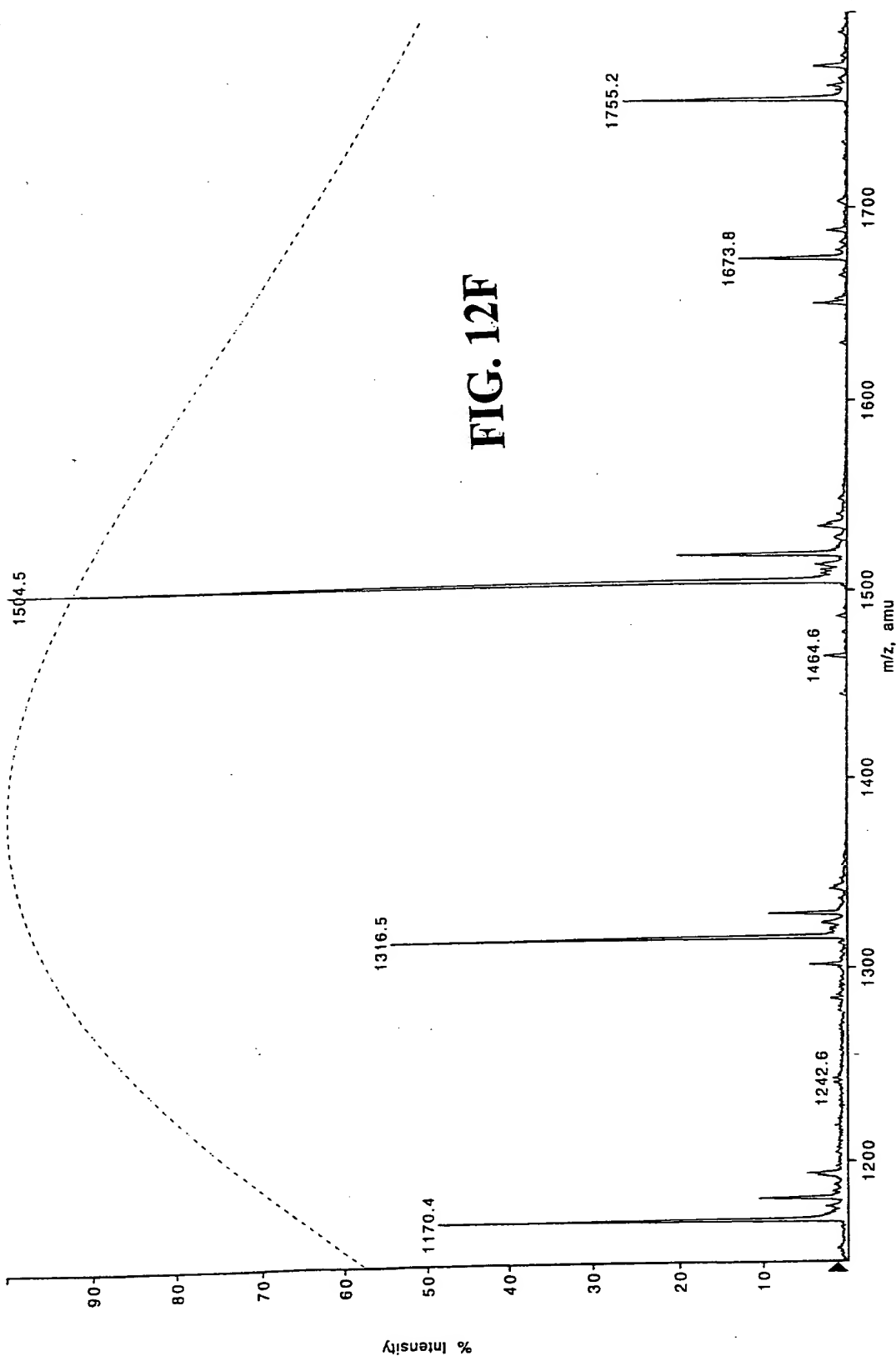
FIG.12E

(m/z SPECTRA P. VIVAX)

BioMultiView 1.3.1
SL/SV19H/InMSpo/b/23/7/98 (Institut Pasteur/CSM/API365/Shirley Longacre/SV19H prep 7/7/98 P.Vivax MSP1 p19dii 100µl [10%HCOOH/MeOH 1/1] @ Int. 5µl/mn IonSpi
Period 1, Expt. 1; Mass range: 1150.0 to 1800.0 by 0.1 amu; Dwell: 2.0 ms; Pause: 2.0 ms
Acq. Time: Jeu 23 jui 1998 at 10:50:11

3.71e6 cps

+Q1 MCA (10 scans): from SL/SV19H/InMSpo/b/23/7/98



(NOESY CYNOMOLGI)

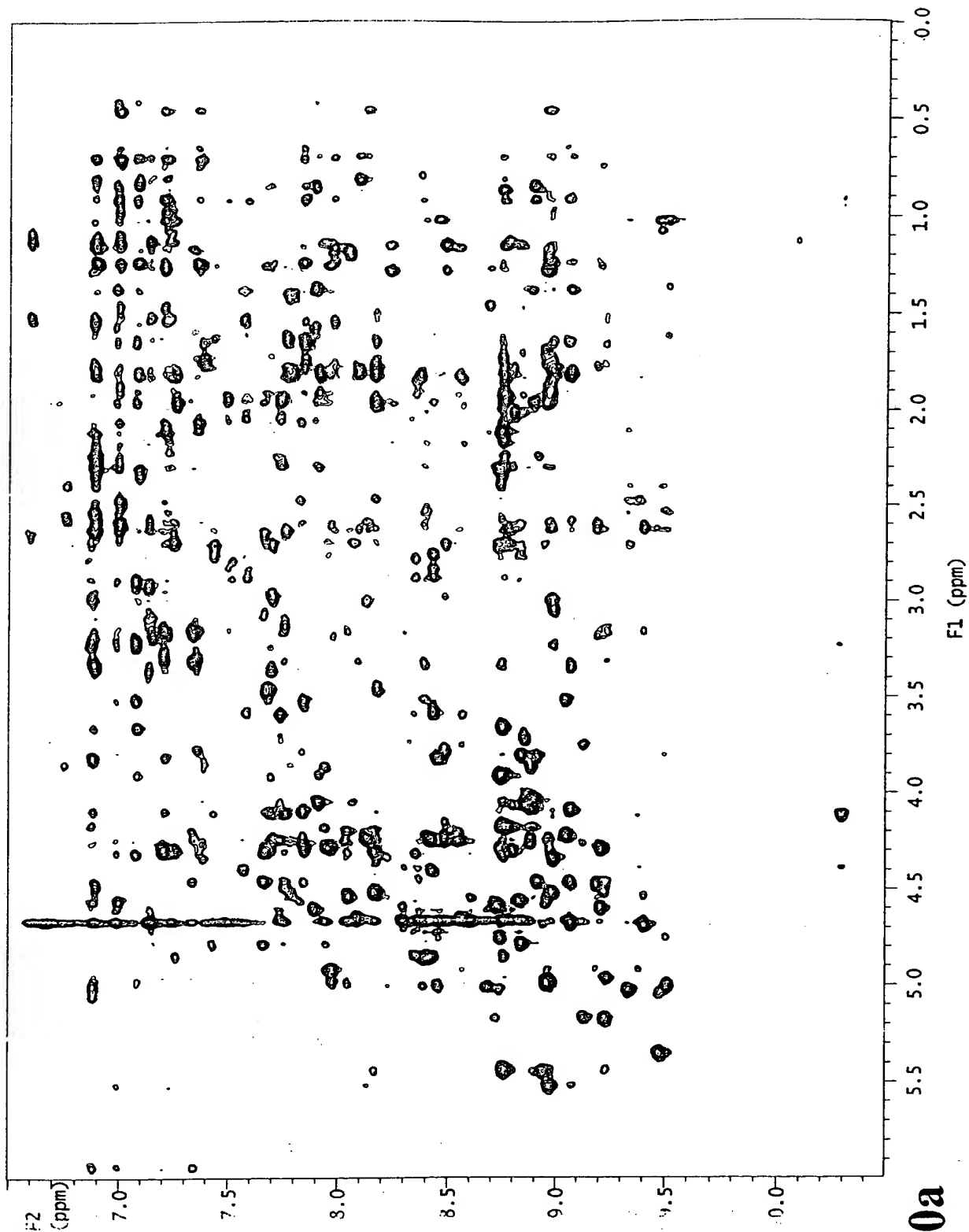


FIG.12.0a

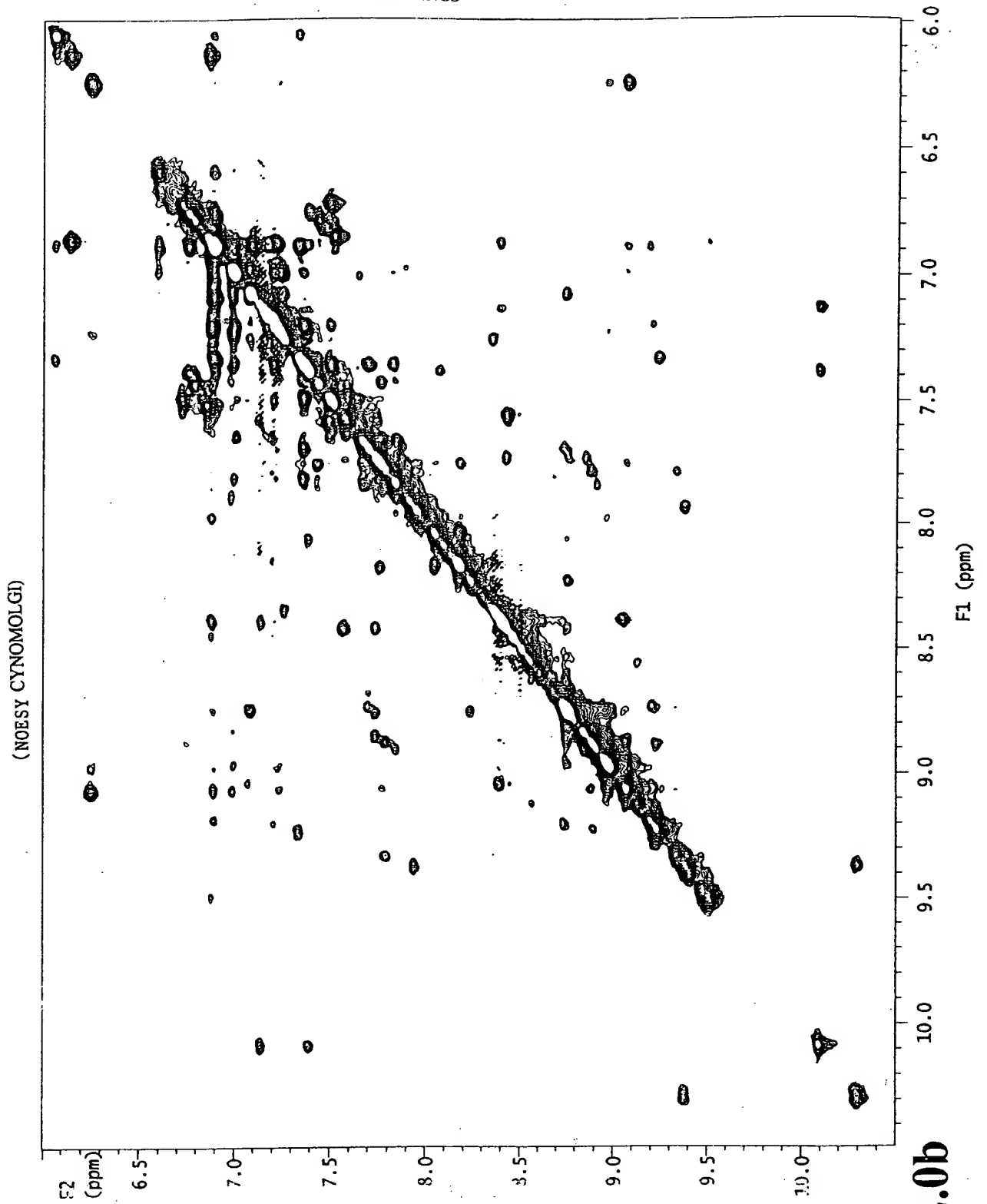


FIG. 12.0b

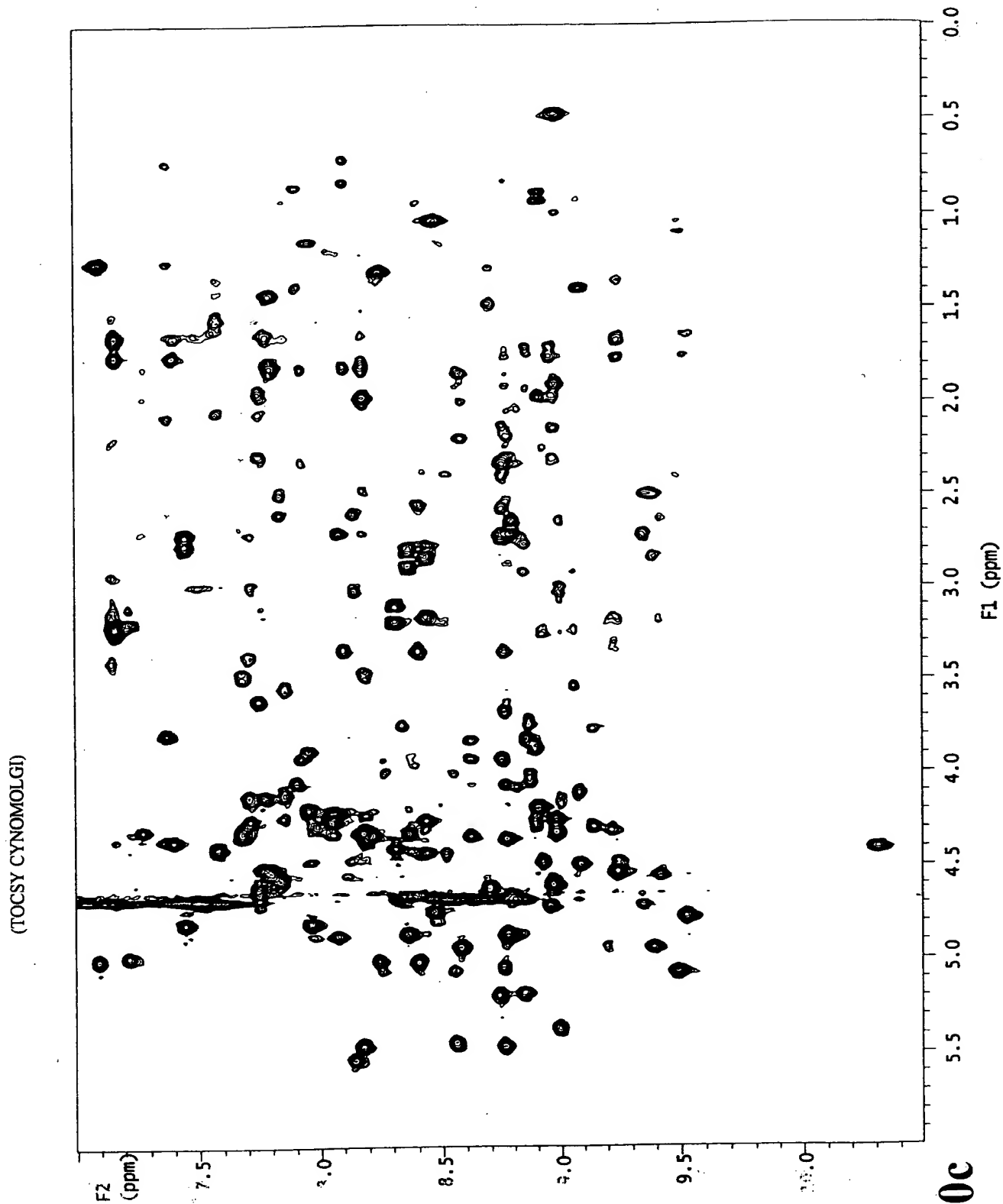


Fig. 12.0c

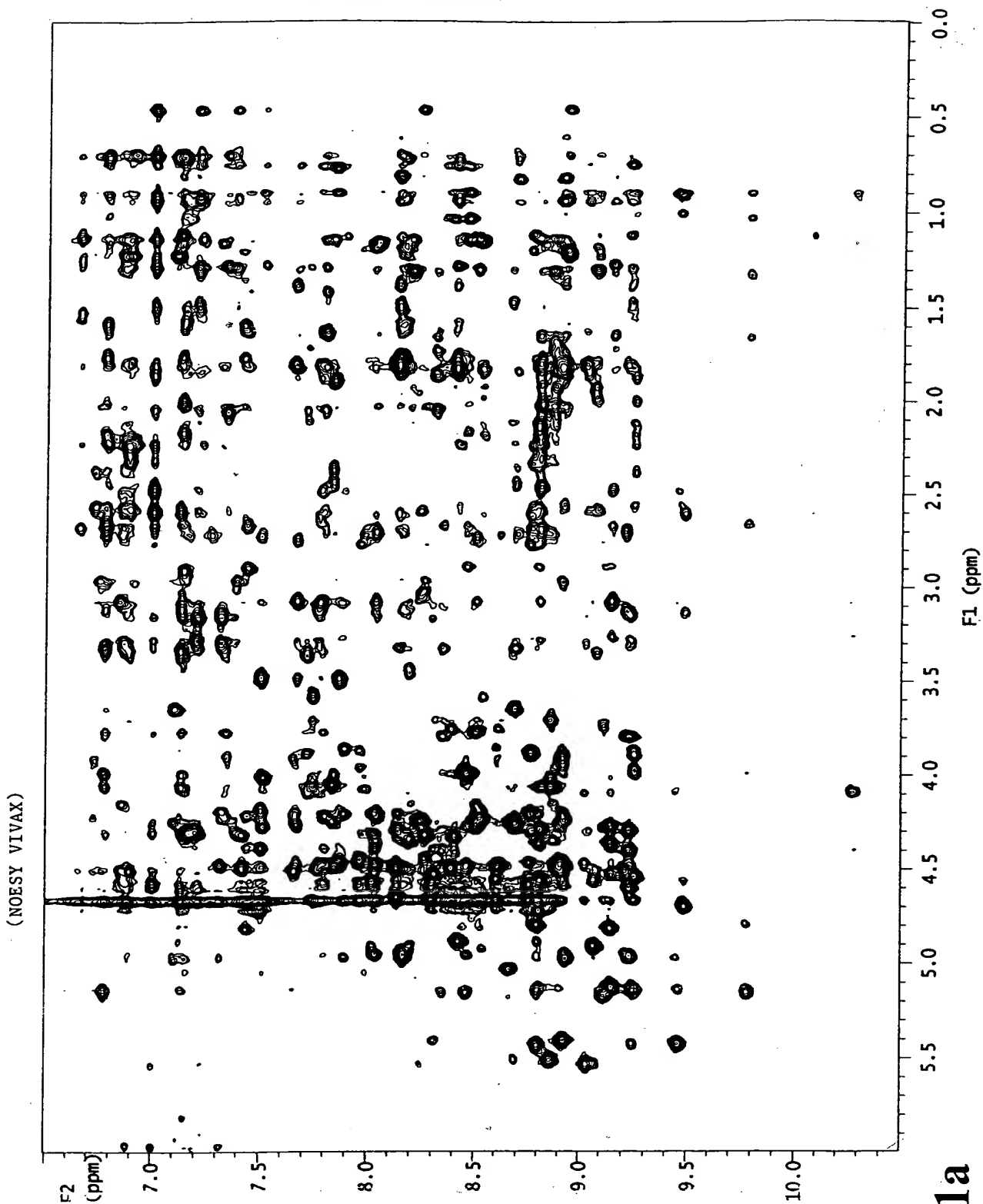


FIG. 12.1a

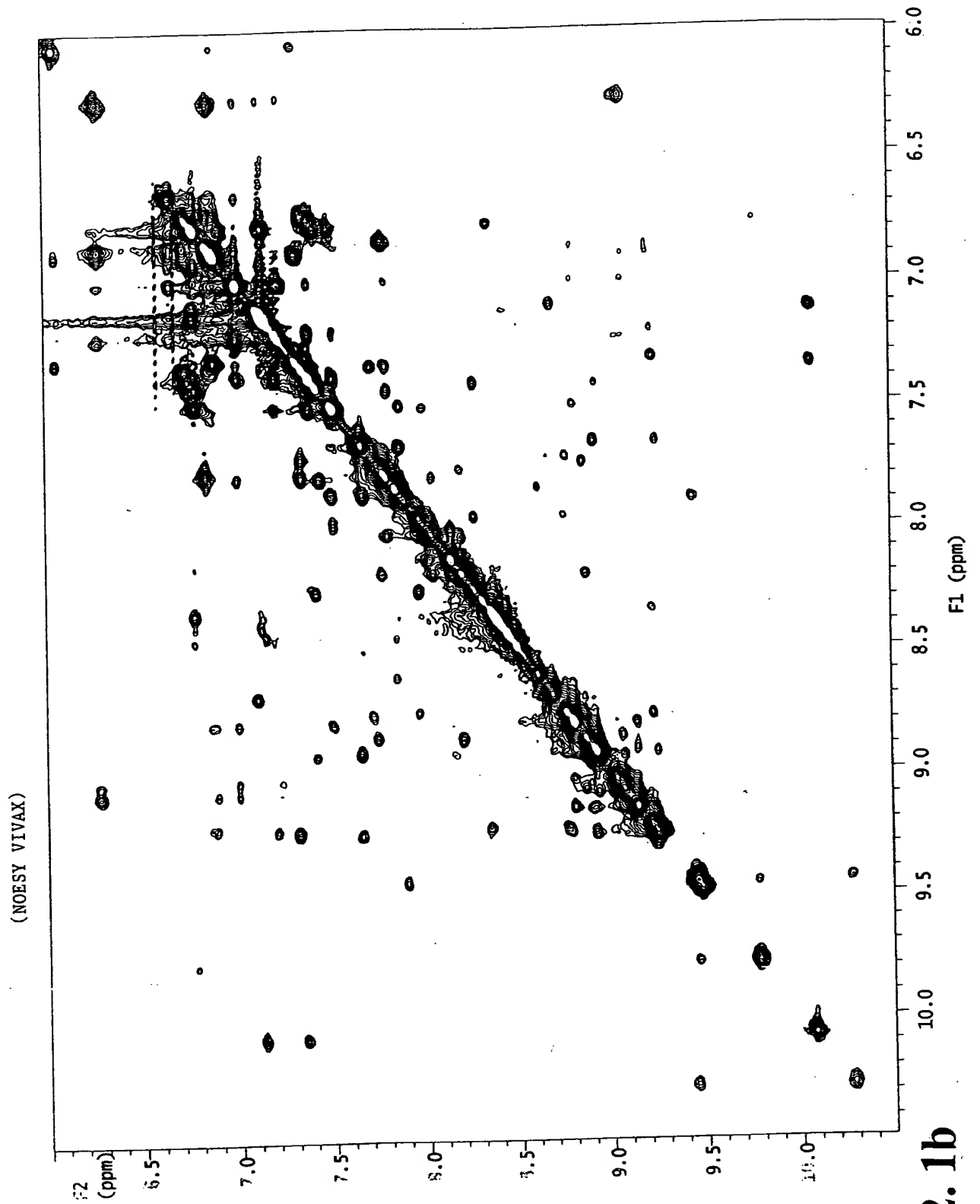


FIG. 12. 1b

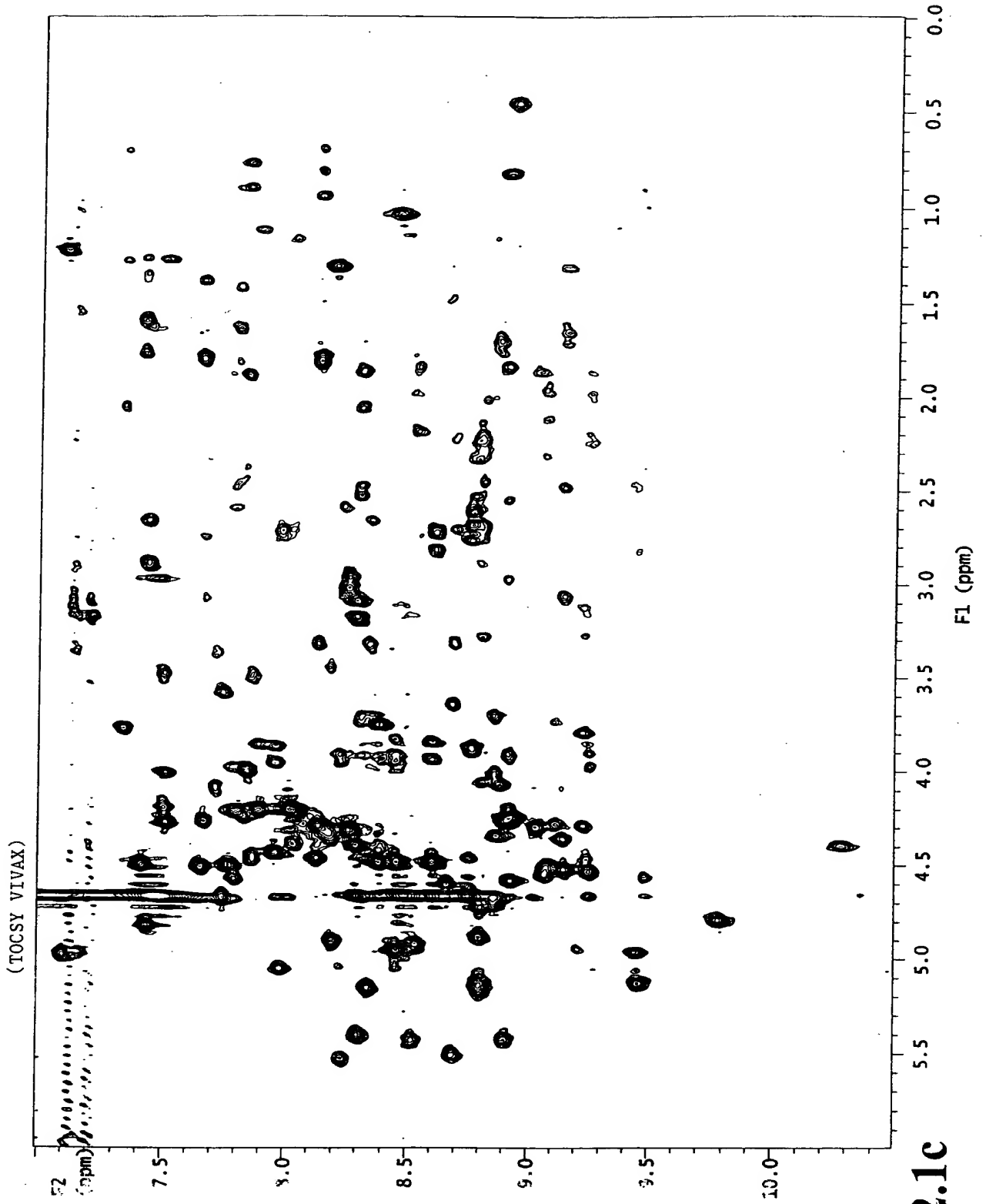


FIG. 12.1c

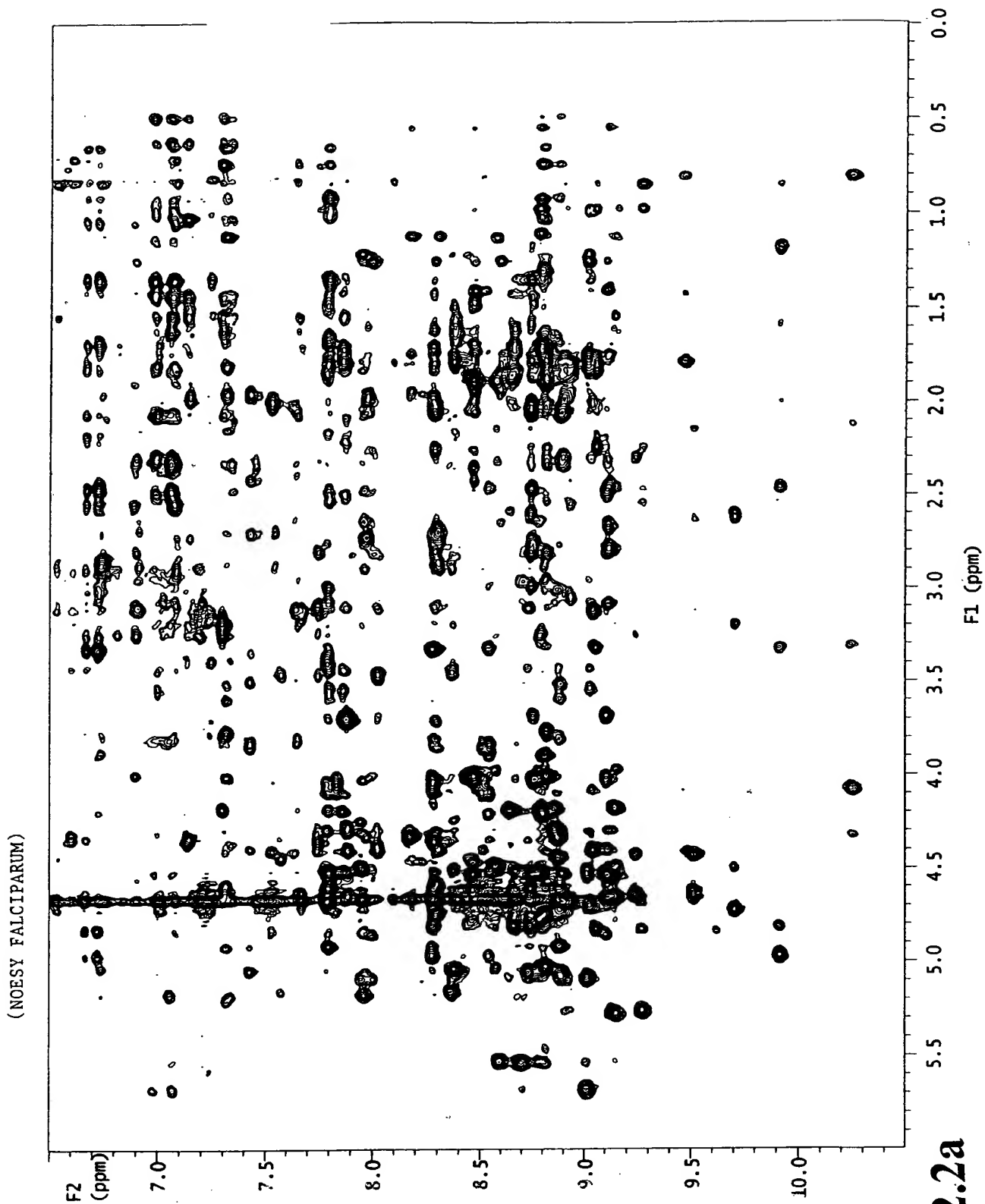


FIG. 12.2a

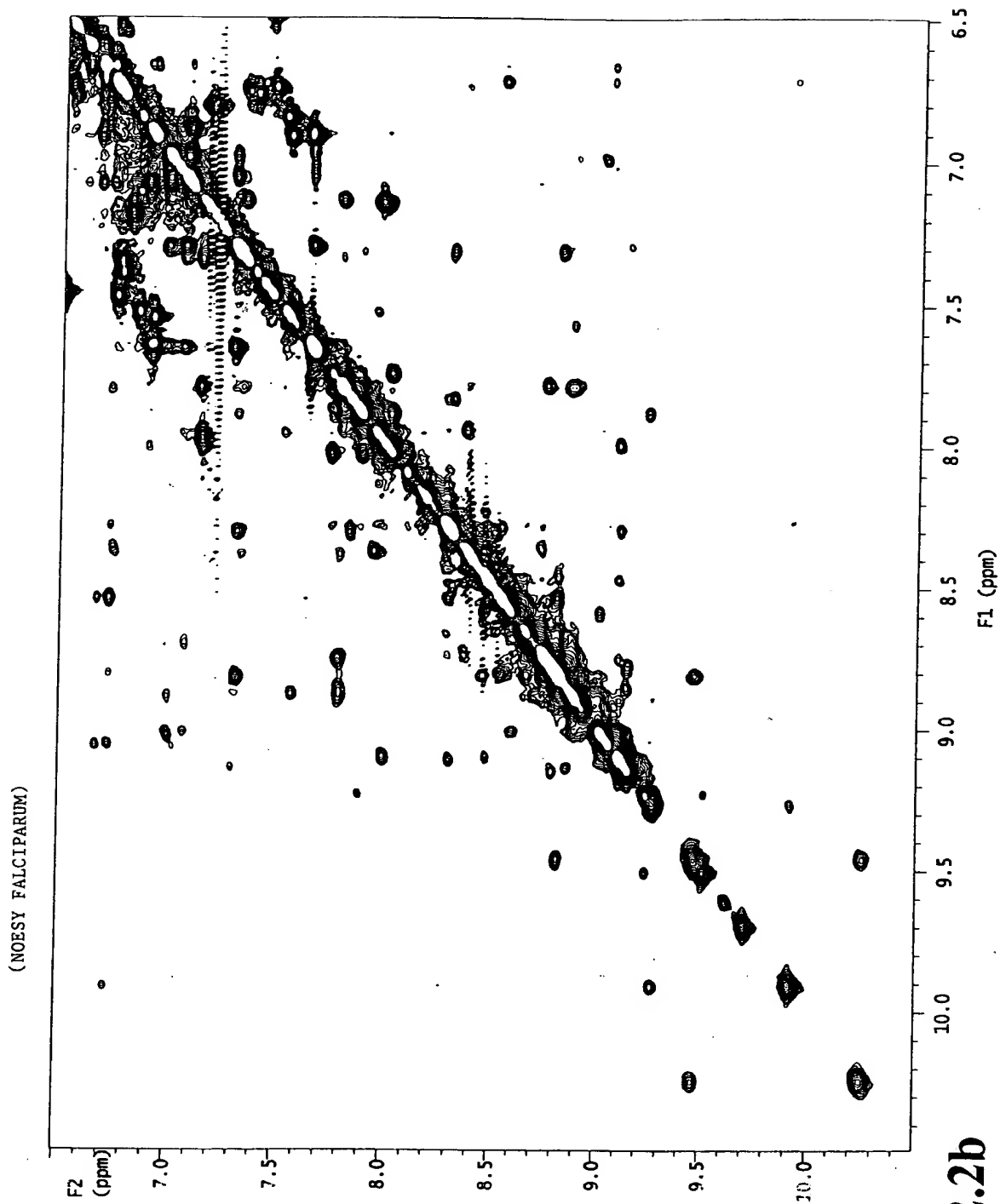
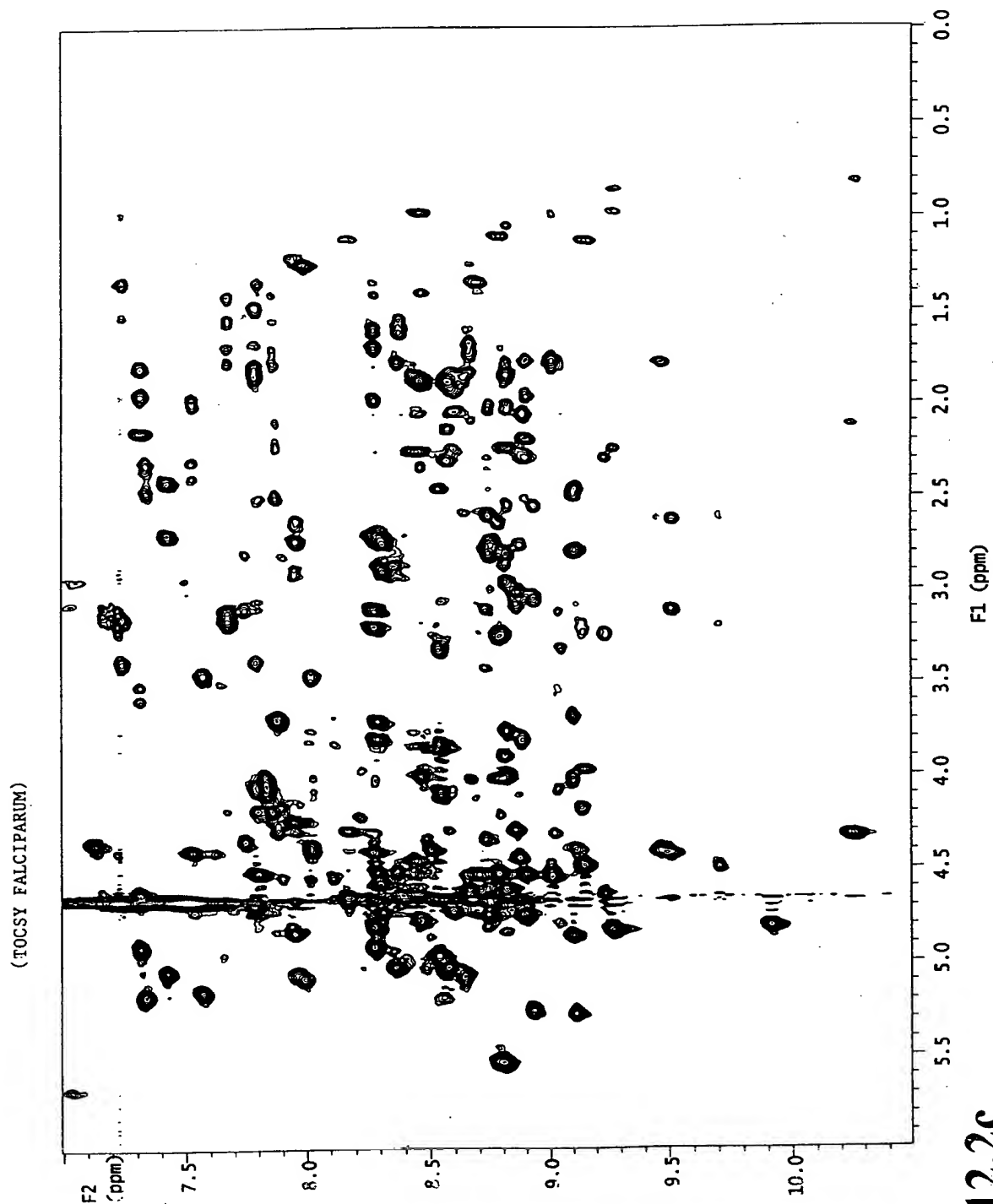


FIG. 12.2b

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IG. 12.2c

Monkey 426 anti-MSP1 p 19

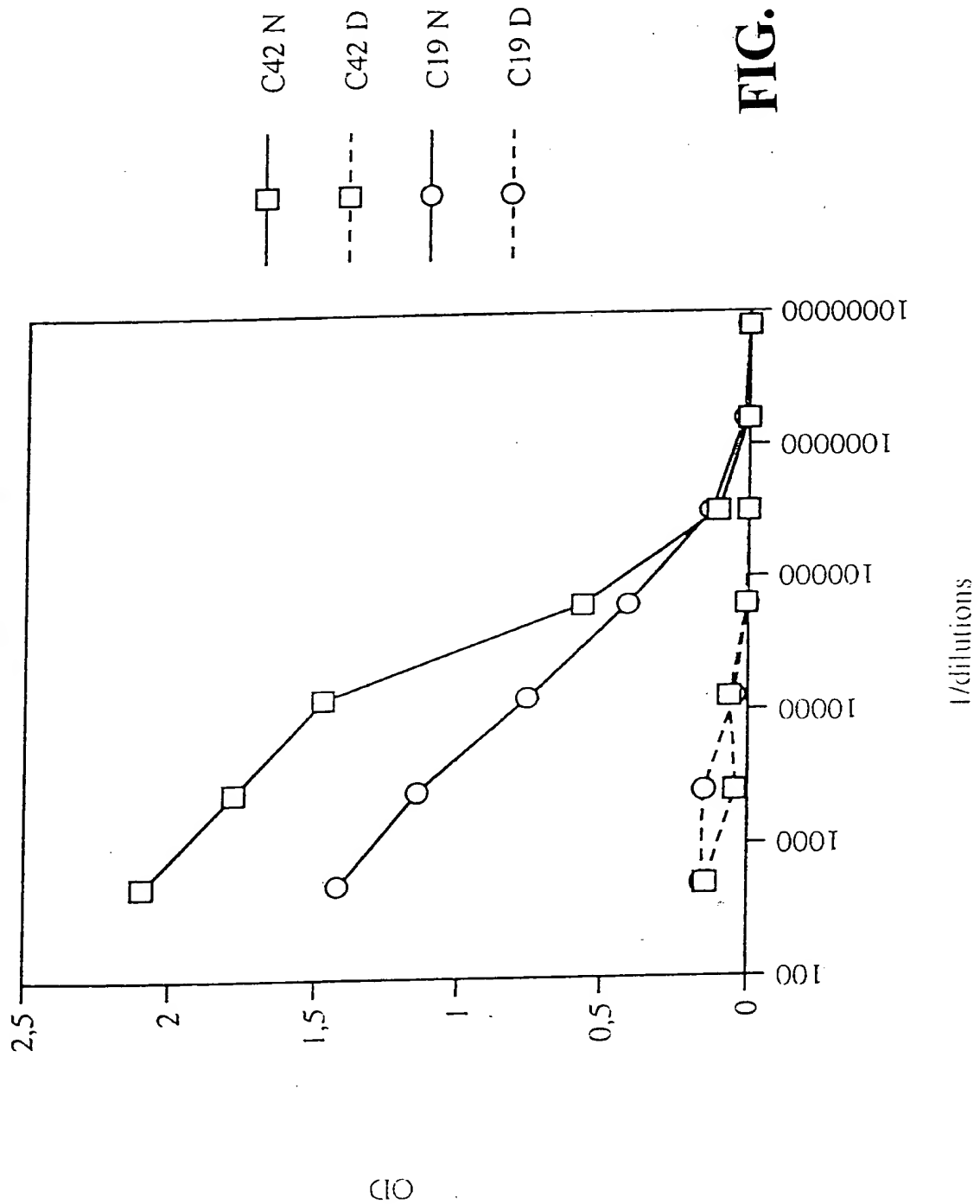


FIG. 13A

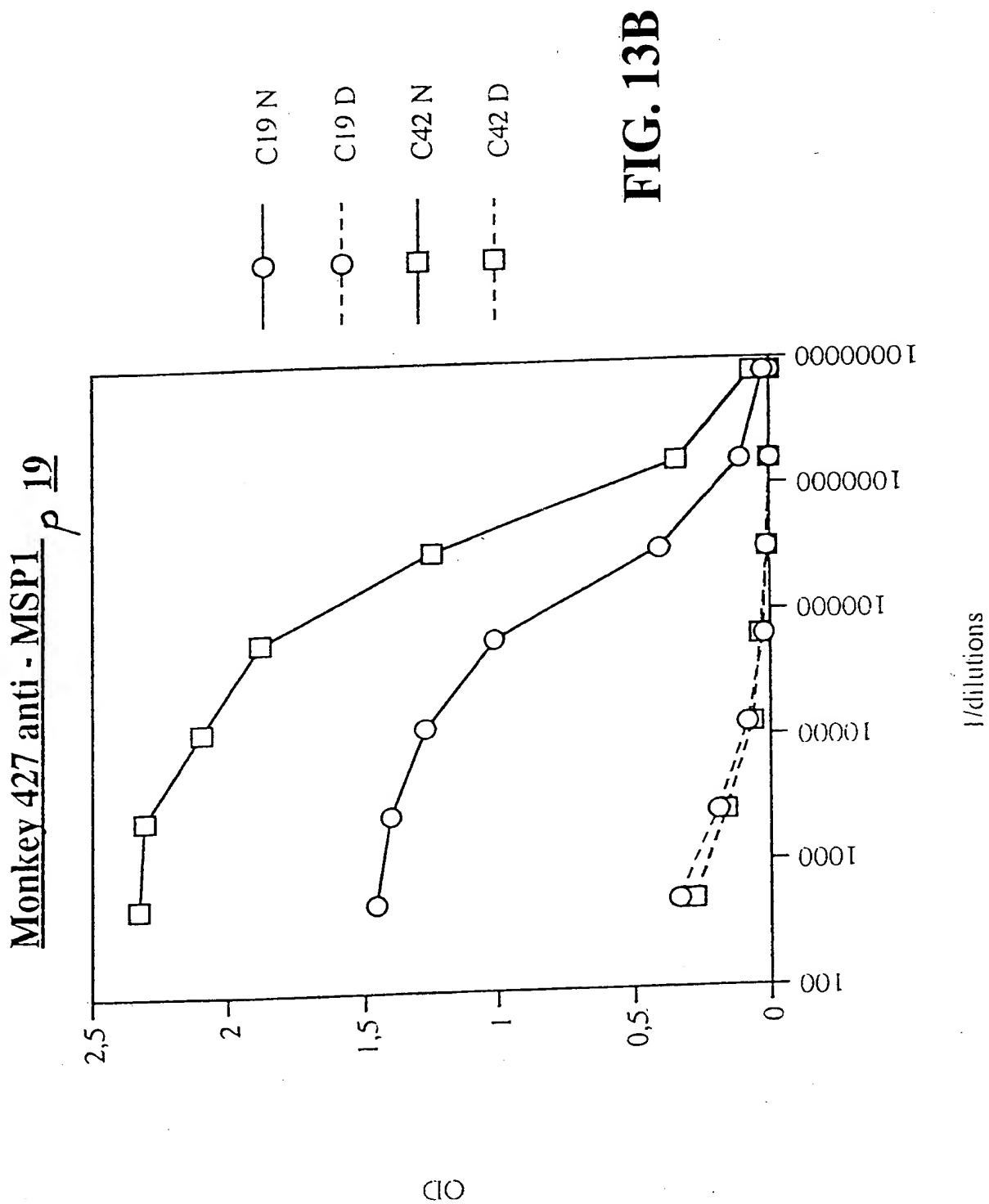


FIG. 13B

Monkey 429 anti - MSP1 p 19

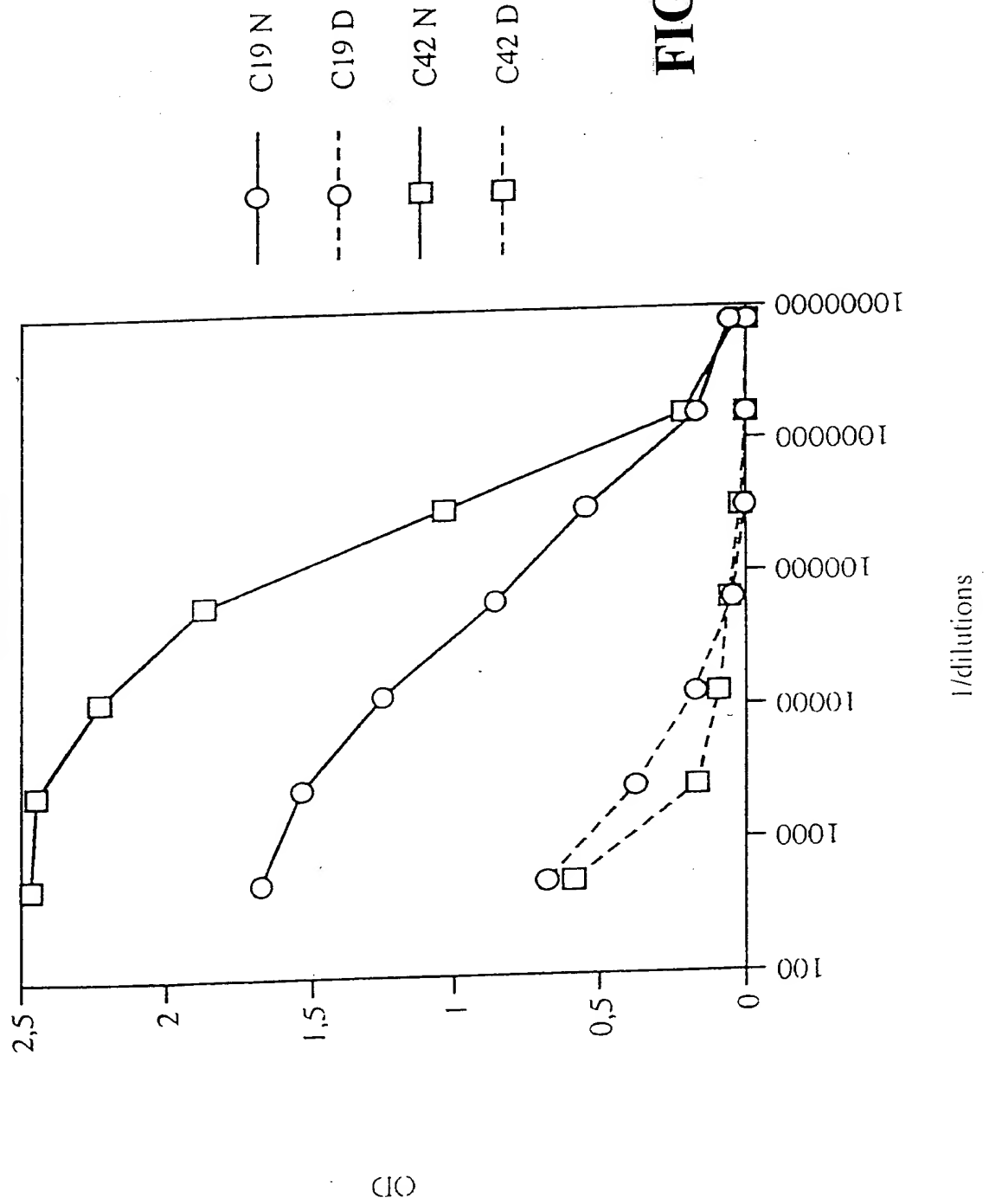


FIG. 13C

Monkey 428 anti - MSP1 p 42

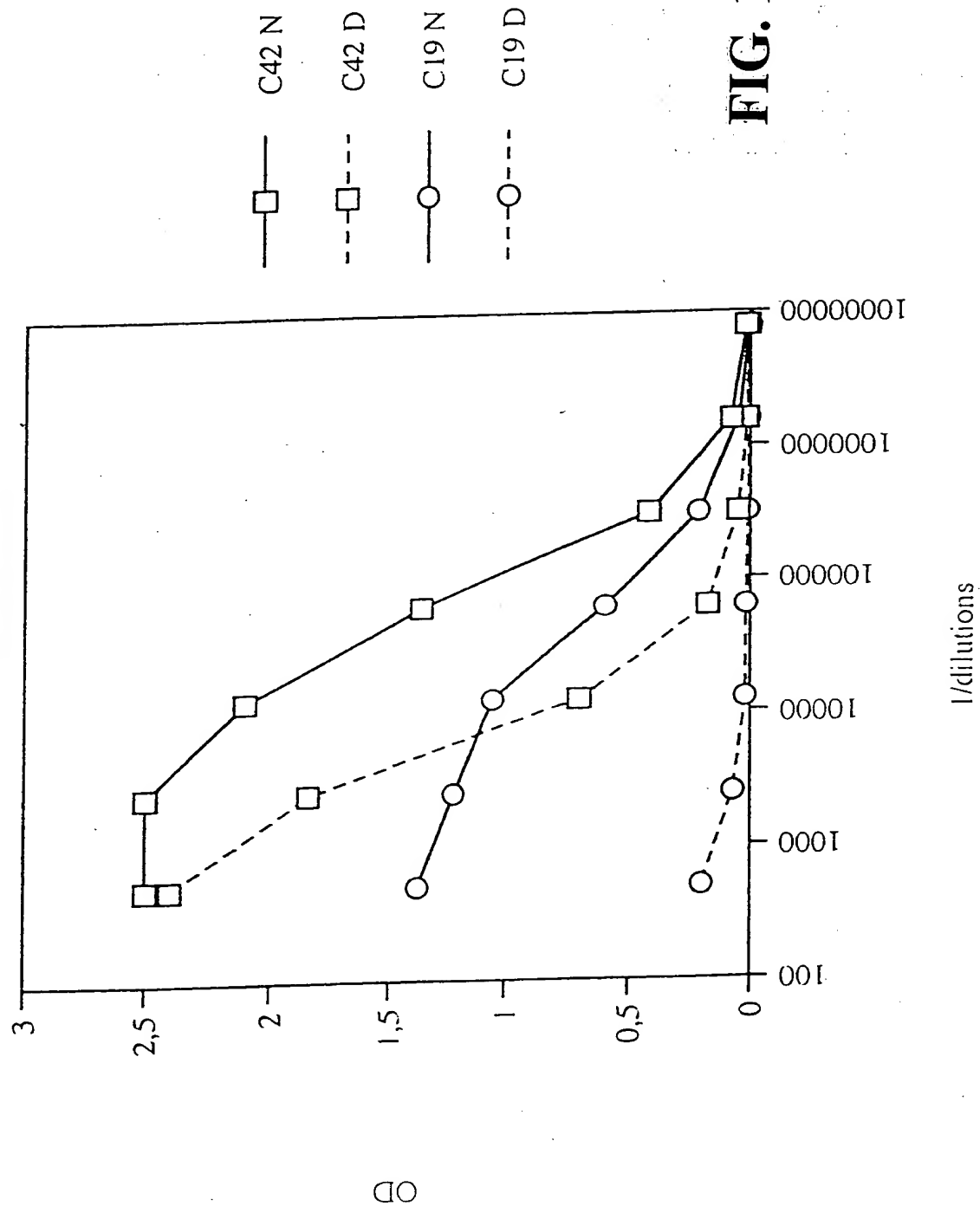


FIG. 13D

Monkey 434 anti - MSP1 p 42

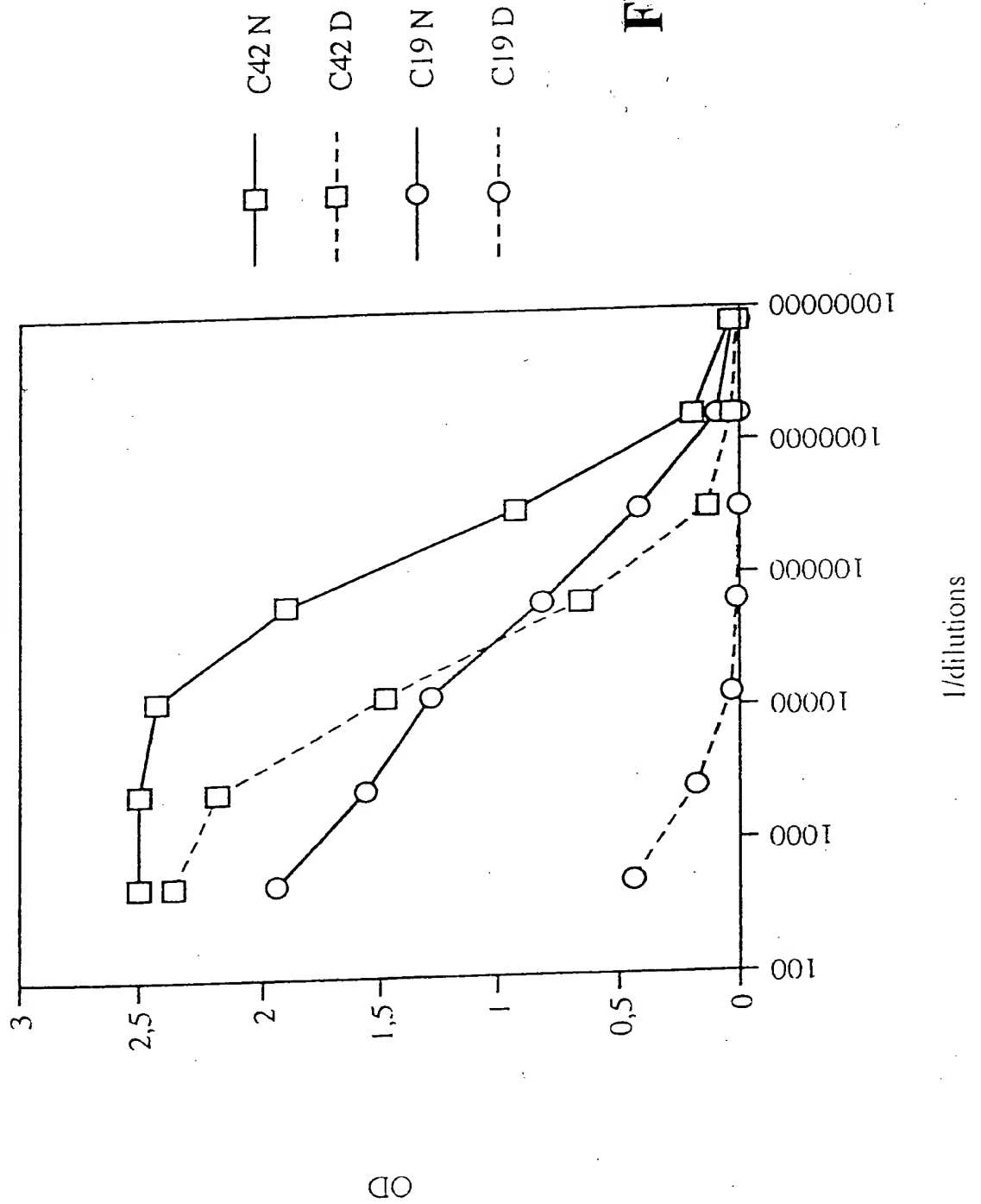


FIG. 13E

Monkey 435 anti - MSP1 p 42

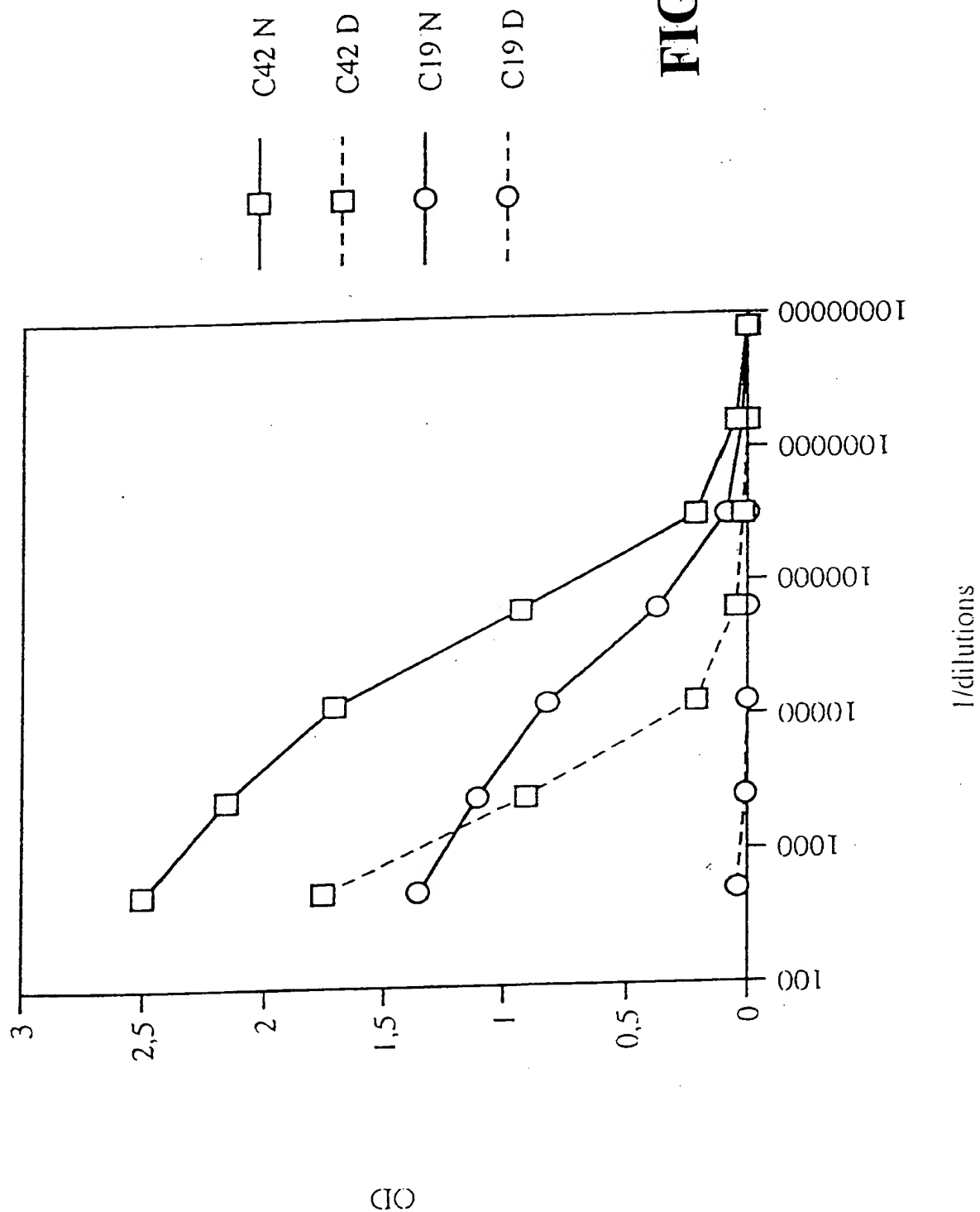
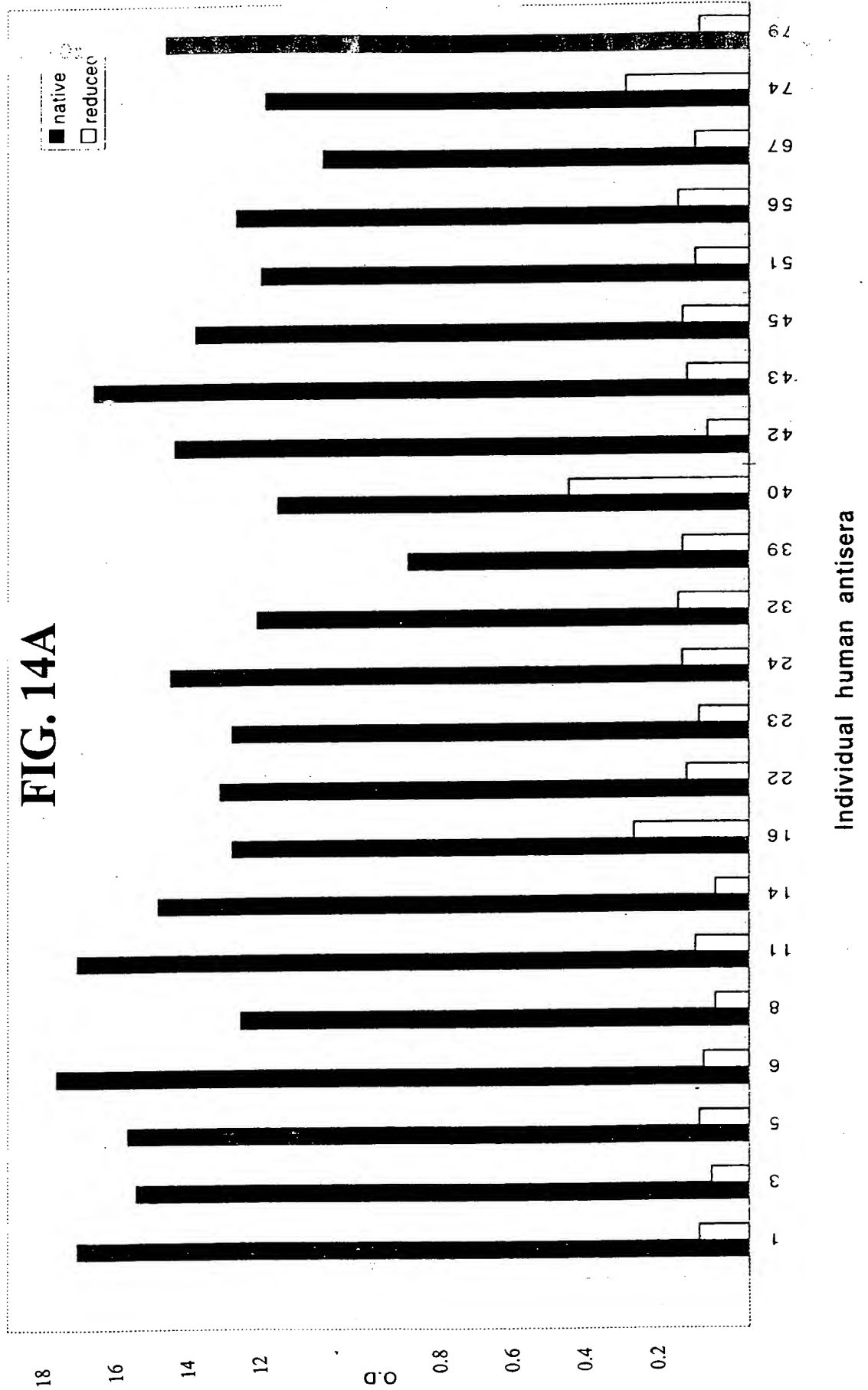


FIG. 13F

Endemic human antisera reactivity with recombinant *Plasmodium vivax* MSP1₁₉
(immunoaffinity purified)

FIG. 14A



Endemic human antisera reactivity with recombinant *Plasmodium vivax* MSP1₁₉
(metalloaffinity purified)

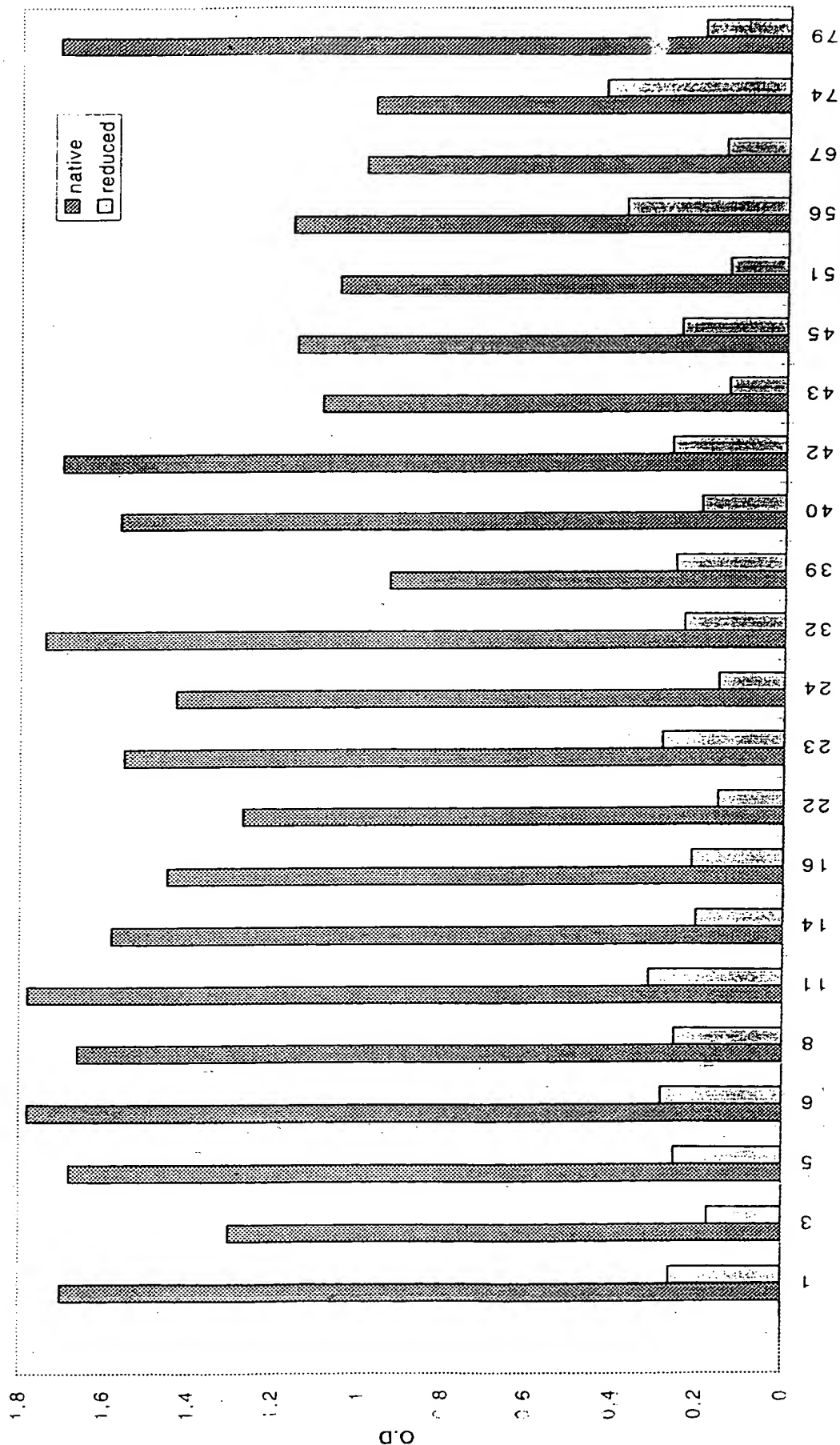
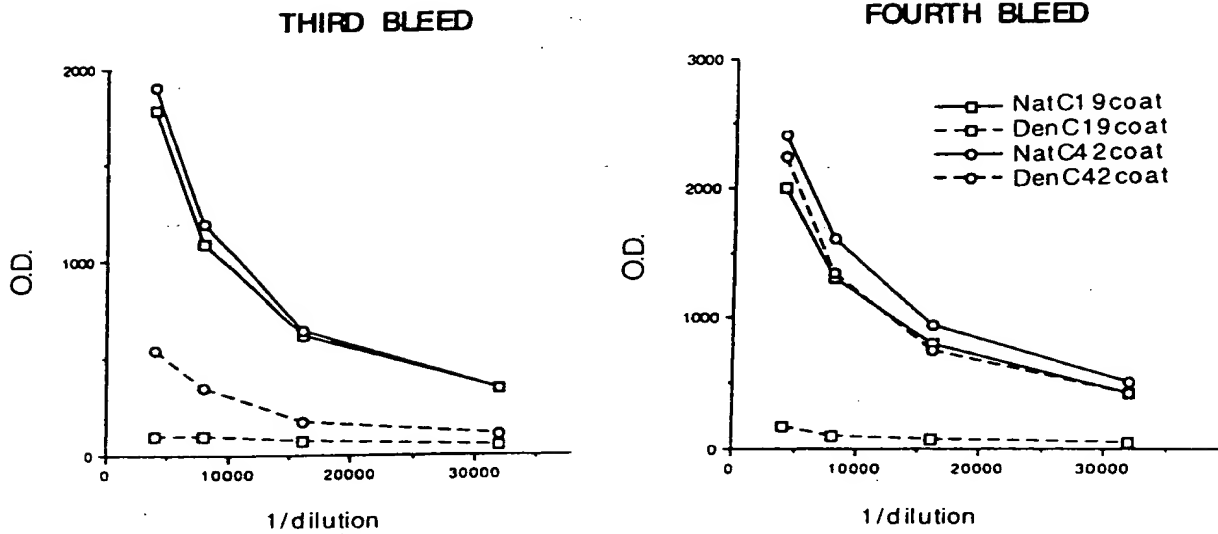


FIG. 14B

ANTI-C42 RESPONSE



ANTI-C19 RESPONSE

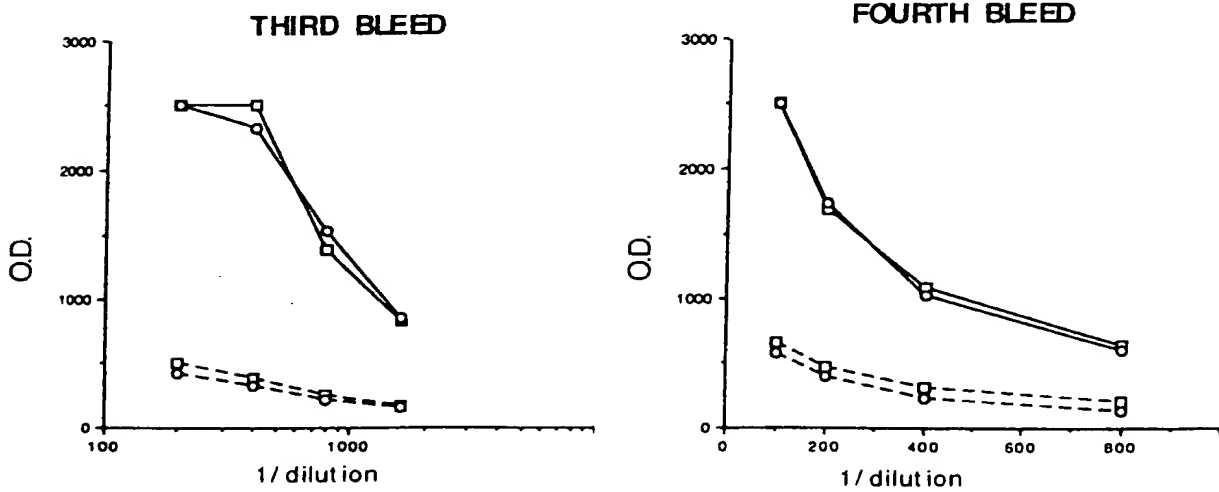


FIG. 15

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